COMPUTERWORLD

INSIDE

Spotlight — Accounting and financial software achieve management-level capabilities. Pullout section.

In Depth — Chief technology officers spot an opportunity for growth. **Page 57.**

Quarterly profits down for the fifth straight time at IBM, while others — such as Apple and NCR — continue to rebound. Pages 4, 73.

Amdahl and TRW are the latest service providers to respond to the lower cost challenge of IBM's Corporate Service Amendment. Page 2.

Information center managers say that with their departments no longer trendy, they must justify their groups' existence on a cost-benefit basis. Page 8.

NAS rolls out its line of midrange processors aimed at the high end of the 4381 series and the low end of the 3090 series. Page 6.

Airline companies wage their reservations systems war across the Atlantic. Page 16.

Prime ups ante in its challenge to DEC's Microvax II. Page 12.

The executive credited with Hogan Systems' stellar earnings recovery abruptly resigns. Page 73.

OS/2 kit a hit with MIS pros

BY DOUGLAS BARNEY

More than half of the 2,000-plus MS OS/2 Developers Toolkits shipped so far by Microsoft Corp. have been snapped up by corporate developers, many of whom say they plan to develop a new generation of personal computer applications with ties to minicomputers and mainframes.

In interviews with *Computerworld,* corporate developers said MS OS/2 will allow applications on a mainframe and minicomputer level to be moved to microcomputers.

"They are talking about the same thing we have had on mainframes for 20 years," said Charlie McLoughlin, manager of software support for auditing at Touche Ross & Co. in New York.

The finished operating system is set to be available early next year. According to Microsoft Chairman Bill Gates, corporations have expressed much more interest in developing for MS OS/2 than they ever did for his firm's MS-DOS.

For one user, MS OS/2 is not just interesting but crucial. "We are running out of gas at 640K because of networks," said Ali Semarzadeh, senior computer systems officer in charge of the future strategy directions for the International Monetary Fund in Washington, D.C. "Our communications can require 80K to 150K [bytes] and prevent some of our applications from running. That has put our networking in jeopardy."

Semarzadeh is looking forward to increased internal development under MS OS/2, in particular taking advantage of its large memory and multitasking

IBM hastens 9370 deliveries

BY ROSEMARY HAMILTON AND STANLEY GIBSON
CW STAFF

In a major push for its new line of 9370 processors, IBM is accelerating some delivery schedules by up to six months and delaying future enhancements that will extend the 9370s into the mainframe realm.

At an analysts' briefing in Dallas last week in which IBM atypically discussed a range of competitive benchmarks, the company said its 9370 Models 20 and 60 will begin general availability shipments today, according to John McCarthy, an analyst with Forrester Research, Inc. in Cambridge, Mass.

When contacted by *Computerworld,* IBM would neither confirm nor deny the shipping date.

However, IBM had previously said that general availability would begin in July.

Six months early

In addition, IBM has informed several customers that they can take delivery of the new line of 9370 processors six months earlier than they were originally told to expect the machine.

Gerald Gualtan, manager of MIS at Komline-Sanderson Engineering Corp., said he has a 9370 on order for the spring of 1988 but that IBM "wanted to

push it up to December."

Another user who was first told to expect the machine in mid-1988 was recently advised that he can take delivery in December.

A software developer expect-

Pouring out the iron
IBM set to establish installed base of all 9370 models well before the end of the year

9370	Original ship date	Early support	General availability
Model 20	Third quarter	March	July
Model 40	Third quarter	June	October
Model 60	Third quarter	March	July
Model 90	Fourth quarter	June	October

CW CHART: MITCHELL J. HAYES

ANSI Fortran revamp rankles giants

BY CHARLES BABCOCK
CW STAFF

A revision of Fortran that recently stirred up the opposition of a powerful set of Fortran computer developers and users is being advanced by a technical committee of the American National Standards Institute.

Digital Equipment Corp., Unisys Corp. and Boeing Computer Services Co. representatives were among the nine X3J3 Committee members voting in Philadelphia recently against what is likely to be Fortran 87 or Fortran 8X, currently designated Fortran 8X.

Several of the features added to Fortran 8X make it too unwieldy, opponents say, while other needed features were left out. If these complaints strike a responsive chord in the user community during the public review process, negative comments on the ANSI standard could force it back to the X3J3 Committee for further modification.

IBM, DEC and Unisys all produce Fortran compilers for their

processors, while Boeing Computer Services provides Fortran business and engineering applications to many customers, including its Seattle aerospace parent, Boeing Co.

"Boeing as a whole makes massive use of Fortran. We have a very strong interest in the new

standard," said X3J3 Committee member Ivor R. Philips, the Boeing Computer Services official who voiced against the new standard. He said the company was still debating how to explain its opposition.

"We're in for a certain

U.S. firms lobby for Toshiba

Vendors urge Congress to withhold sanctions

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Computer, Inc. said U.S. computer manufacturers depend on Toshiba-made semiconductors and other components and that those companies are worried about foreign retaliation in response to U.S. sanctions.

The comments were made at a hearing held by the House Ways and Means Committee, which is considering legislation similar to the two-year import ban passed by the Senate June 30 [CW, July 6]. A week later, the Department of Commerce suspended Toshiba's blanket import

WASHINGTON, D.C. — Several industry lobbyists last week urged Congress to shield the industry from any import ban or other trade sanctions imposed against Japan's Toshiba Corp., which is under fire for a subsidiary's sale of military technology to the Soviet Union.

Representatives of the Computer and Business-Equipment Manufacturers Association, the Computer & Communications Industry Association and Apple

IN THIS ISSUE

Closing the gap. NAS upgrades the chip technology in its intermediate AS/VL CPUs, countering IBM's move to plug the price/performance gap between its mid-range and large-scale processor lines with a third generation of 4381 machines. Page 6.

Opening communications lines. Micom brings voice, data integration to mid-range users with a multiplexer that permits high-quality voice to be sent over 56K bit/sec. dedicated lines. Page 9.

Gaining business perspective with software. Pullout section.

NEWS

Service rivals cut prices

TRW, Amdahl reductions counter IBM's CSA

BY STANLEY GIBSON
and ALAN ALPER
CW STAFF

Joining the growing number of maintenance providers that are cutting their prices in response to IBM's Corporate Service Amendment (CSA), TRW, Inc.'s Customer Service Division and Amdahl Corp. will soon lower their prices.

Computerworld last week was informed that in mid-August, TRW's Customer Service Division, which maintains IBM's and other manufacturers' gear, will decrease its maintenance charges by as much as 20% on IBM equipment under a plan called Service Plus.

TRW, which specializes in servicing networks and small systems, previously offered prices that were 20% to 25% lower than IBM's regular prices, according to Donald Goodspeed, president of Computer Maintenance Consultant, Ltd. in White Plains, N.Y.

Goes the extra mile

Effective Aug. 15, TRW will reportedly offer 24-hour, seven-day-a-week service at no extra charge, a move that mirrors IBM's CSA. In addition, TRW said it will guarantee its maintenance charges for two years and, unlike IBM, will not penalize customers who decide to cancel.

In March, IBM revised its CSA to offer 24-hour, seven-day-a-week service to customers under the plan at no extra charge. First introduced last fall, CSA discounts on network service can be as much as 33% lower than regular IBM maintenance prices.

However, the revised CSA does have some sticking points. Customers must take a test showing that they are in control of day-to-day operations and troubleshooting in order to qualify for the program. And while prices are guaranteed to remain within limits for fixed periods of time, customers can be assessed additional charges for withdrawing from the program.

Concierge service

Under Service Plus, TRW will guarantee response times, the company said. The division said it is also providing customers with a "concierge" who is assigned to coordinate services and troubleshoot problems when they occur.

"We're looking to give customers a high level of service with no strings attached," said Paul Snyder, TRW Customer Service Division's recently appointed vice-president and general manager. "We don't require customers to do things the way IBM does."

For several weeks, Amdahl has been notifying its customers that it will lower maintenance charges by between 11% and 23%, a company spokesman acknowledged. The spokesman declined, however, to offer a list of the different discounts offered on various pieces of equipment.

However, one customer said he was notified that maintenance charges are being reduced on Amdahl 580 and 5890 processors by up to 23%.

In addition, he said he was told that Amdahl will reduce the rates for 24-hour, seven-day-a-week maintenance for its 6380 and electronic direct access storage products by approximately 17%.

Amdahl's changes are effective Aug. 1 and will be automatically reflected in customer bills, the company said. Customers with multiple systems are still eligible to receive additional discounts under Amdahl's System Maintenance Discount Plan, according to the vendor.

"We are in a competitive world, and our pricing has to be competitive vis-a-vis competitors'," such as IBM's CSA, the Amdahl spokesman said.

Impact seen in prices

"The impact [of the CSA] is highly competitive pricing and exclusion of others," said Bob Djurdjevic, president of Annex Research, Inc. in Phoenix.

Djurdjevic said maintenance rates of IBM plug-compatible vendors such as Amdahl have always been higher than IBM's own rates.
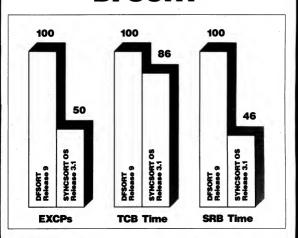
An IBM 3090 Model 600E, for example, carries a monthly maintenance charge from IBM of approximately $14,000, but a comparable Amdahl processor costs $19,700 per month for Amdahl to service, Djurdjevic said.

A spokesman for AT&T, a large Amdahl customer, said his company has been advised by Amdahl of the change. Amdahl does not maintain all of AT&T's Amdahl equipment, however, and the spokesman said it is too early to tell whether Amdahl will be given a larger slice of the maintenance pie.

Both Sorbus, Inc. and Control Data Corp.'s Engineering Services Division have begun offering plans to compete with the terms and conditions of CSA and offer substantial discounts [CW, June 1].

In addition, Sorbus recently acquired Pacific Computer Corp., a Milpitas, Calif., company that specializes in maintenance of Amdahl equipment. Atlantic Magnetic Trace, Inc. recently announced a discount program (see story page 51).

Profits still down at IBM

Income falls almost 10% despite high demand for PS/2, early shipments

BY CLINTON WILDER
CW STAFF

ARMONK, N.Y. — Still claiming slowly out of a two-year business trough that has outlasted the industry slump, IBM last week reported its fifth straight quarter of earnings below year-earlier levels.

Although a last-minute wave of financial analysts' enthusiasm raised market expectations that IBM's results failed to meet, most analysts said they saw few fundamental surprises in the 9.8% drop in net income.

"The quarterly results were something of a nonevent," said Stephen Smith, a computer hardware analyst at Paine Webber, Inc. "Orders were a bit better than in the first quarter, but a lot of that came at the low end of the product line. It was, as expected, a transition quarter."

Profits fell to $1.18 billion, or $1.95 per share, from $1.3 billion, or $2.12 per share, in the second quarter of 1986. IBM eked out a revenue gain of 4.3% from $12.27 billion to $12.8 billion.

In a prepared statement, IBM Chairman John F. Akers noted that IBM began early shipments of 3090E mainframes and 9370 minicomputers in the quarter, and he said that Personal System/2 demand was strong. But Drexel Burnham Lambert, Inc. mainframe analyst Peter Labe said those products have not yet had much financial impact.

"Those will all be second-half volumes," Labe said. "In fact, for IBM to pull out 4% revenue growth with nothing new to sell is really not bad."

Could restore earnings

On the strength of those new products and a reduced cost structure, however, IBM is still expected to restore earnings

Not out of the woods yet

IBM's percentage gain and decline in revenue and earnings in comparison to year-earlier quarters

PERCENT

(bar chart showing values: 10, 8, 4, 3, -1 for 1985-1987)

PERCENT

(bar chart showing values: 23, -13, -18, -27, -23, -48 for 1985-1987)

1985   1986   1987

CW CHART

grow, but by how much."

But regardless of a lower cost structure, analysts noted that competitive pricing across the hardware product line will continue pressure on profit margins and probably prevent the margins from ever reaching their levels of 1984, IBM's last strong growth year.

In the mid-range, for example, IBM has had to price the 9370 aggressively in an attempt to win market share away from

the third quarter, high-end 3090E sales volumes should begin to pick up. Paine Webber's June survey of IBM mainframe buying intentions for the year found that 24% of surveyed corporate users intend to buy this year, compared with the 16% who responded positively in March.

In addition, IBM's unprecedented work force and expense reduction plan of the past 18 months is expected to begin lowering the firm's break-even point. The company said 13,000 employees, or 1,000 more than previously announced, took advantage of the early retirement incentive program that ended June 30.

Labe estimated that IBM will save an average of $60,000 annually for each departing employee and that it will slash overall expenses by $1 billion.

IBM's revenue from maintenance services grew only 5.6% in the second quarter to $1.93 billion. The growth rate is expected to erode further in the third quarter, the first full quarter of deep maintenance price cuts under IBM's Corporate Service Amendment, which took effect June 1.

"That's an area where IBM and others have been aggressive, and it's slowing," Paine Webber's Smith said. But most watchers said they expect growth to be restored in the long run as IBM expands its installed base of hardware to be serviced.

Rise in software revenue

IBM's most encouraging financial news was in software, in which revenue — primarily from mainframe operating system licenses — grew 23% in the second quarter to $1.53 billion.

IBM's software revenue represented 12% of total sales, up from 10% one year earlier. Djurdjevic predicted that IBM's gross margins on operating system licenses, already higher than 70%, could rise to more than 80% by next year.

"It's all blue sky, all upside on software," Djurdjevic said. "IBM's MVS and VM are the one area where they still can call all the shots. If that were ever to change, IBM's entire strategy would come tumbling down like a house of cards."

IBM's second-quarter results benefited significantly from the weak U.S. dollar. The company said foreign currency differentials raised its profits by $115 million and its revenue by $840 million.

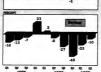# Symantec unveils Q&A writing tool

BY DOUGLAS BARNEY
CW STAFF

CUPERTINO, Calif. — In an effort to leverage the success of its Q&A, an integrated file manager and word processor, Symantec Corp. last week announced Q&A Write, a word processing package priced at $199.

Q&A Write is aimed at middle managers who are interested in creating documents but do not need a complex and expensive word processing package, according to Rod Turner, Symantec executive vice-president. "Middle managers don't want to become experts in using their PC," Turner said.

The product is scheduled to ship this month.

According to Turner, Q&A Write will directly compete against Professional Write, a popular package from Software Publishing Corp. Q&A Write is not expected, however, to compete with high-end products such as Ashton-Tate's Multimate Advantage II, Wordperfect Corp.'s Wordperfect and Microsoft Corp.'s Word.

Q&A Write is an enhanced version of the word processing module within Q&A and includes support of most popular laser printers, font control and enhanced data import and export capabilities. Users can run Lotus

Development Corp.'s 1-2-3 or other popular applications from the Q&A menu. The package reportedly can import complete 1-2-3 work sheets into documents.

For corporate users needing to share documents with host systems, Symantec said it will offer, for $29, an IBM Document Content Architecture utility that

provides document import and export capabilities for 15 popular word processing packages.

The product, however, lacks many of the features available on higher priced word processing packages, such as built-in dynamic outlining and footnotes. Outlining capabilities may eventually be offered by using technology from Living Videotext, Inc., which was recently acquired by Symantec.

CORRECTIONS

Swanson Analysis Systems, Inc.'s Ansys can be used by customers as a benchmark [CW, June 8], but the product primarily functions as a finite-element analysis program.

Merge 386 was incorrectly referred to as an operating system in which Unix runs as a task under Microsoft Corp.'s MS-DOS operating system. MS-DOS runs as a task under Unix.

NAS intros counter IBM in processor fray

BY JEFFRY BEELER
CW STAFF

MOUNTAIN VIEW, Calif. — As expected, National Advanced Systems Corp. (NAS) last week countered IBM's recent move to plug the price/performance gap between mid-range and large-scale processor lines.

Announcement of the four AS/VL intermediate systems comes hard on the heels of the debut of IBM's third generation of 4381 machines, including the 4381 Models 23 and 24 and introduction of the entry-level 3090 Model 120E. In unveiling the 4381 upward and 3090 downward, IBM bridged the intimidating price gulf that had long divided its medium- and large-scale CPU lines, according to Rick Martin, a research analyst with New York brokerage house Sanford C. Bernstein & Co.

For more than 20 years, "very few users could ever afford to jump the gap," which typically ranged from $1 million to $2 million, Martin said. When they exhausted the capacity of their existing machines, "it was a lot less expensive simply to buy a second mid-size system instead of a bigger machine."

IBM's intent in filling the price gap between its processor families is to induce 4300 series users who might otherwise have balked at migrating to the 3090

to take the plunge, he said.

But in positioning a range of systems where none previously existed, the industry giant has also intensified the competitive pressure on NAS, which has countered the challenge by upgrading the semiconductor technology in its intermediate CPUs.

With the AS/VL, the company has adopted a "layered technology" approach in which each systems module uses a different kind of circuitry, according to Dave Profio, NAS's manager of domestic marketing.

Similar design

The design concept resembles the one underlying the plug-compatible vendor's top-of-the-line AS/XL mainframes. For example, with the three AS/VL uniprocessor models and one dyadic machine, NAS uses

2,000- and 5,000-gate emitter-coupled logic chips, which operate at 260 to 250 picosec.

In the I/O processor, NAS uses 24,000- and 40,000-gate CMOS components while incorporating 4K- and 64K-bit bipolar CMOS technology in the associated cache buffers and dynamic

working storage. The AS/VL also reportedly marks the first use in a mid-range system of IBM-bit CMOS memory chips.

Together, the various categories of circuitry "allow NAS to price its systems even more aggressively than the 3090 Model 120," said First Boston Corp. Vice-President Steve Milunovich. "Technology will definitely give the AS/VL a price/performance boost over IBM."

The AS/VL series offers a 15% to 20% advantage in price/performance over its IBM coun-

terparts, Profio said. The largest of the three uniprocessors, the AS/VL 60, provides 3.5 to 4.2 times more throughput than the firm's existing AS/6660 CPU and outperforms the AS/VL 40 and AS/VL 50 by 40% to 55% and 25% to 35%, respectively. The dyadic AS/VL 80 offers

70% to 90% more computing power than the AS/VL 60, according to NAS.

By implementing much of the processor family in dense CMOS, NAS minimized the machines' parts counts and reduced their footprints to 16.1 sq ft, Profio said.

The CMOS chips' heat dissipation also reportedly allows the AS/VL to provide increased processing power while using the air-cooling scheme utilized in earlier NAS systems.

By contrast, IBM uses air

cooling in the 4300 and relies on water cooling in the larger 3090 family, which requires costly plumbing additions when a user migrates from the 4381 to the 3090.

Upgrade hesitation

Because such facilities changes are costly, many 4381 customers will hesitate to upgrade to the 3090 even with the recent closing of IBM's price gap, according to 4381 user Phil Granmatica, DP director for the City of Anaheim, Calif.

In the wake of its AS/VL introduction, NAS's Japanese hardware supplier, Hitachi Ltd., ceased production of the NAS AS/6600 family. In addition, the firm said it will continue to make small quantities of the AS/6000 for a limited time.

All three of the field-upgradable AS/VL uniprocessors support a minimum of eight channels and 8M bytes of memory and expand to 32M bytes and 128 channels. Delivery is set to begin this quarter.

The AS/VL 80 also holds eight to 32 channels but has twice the main memory capacity of the other three models.

Shipments of the dyadic complex will reportedly start during the fourth quarter.

Base configuration prices are $638,000 for the AS/VL 40, $891,000 for the AS/VL 50, $1.3 million for the AS/VL 60 and $2.1 million for the AS/VL 80.

Dueling mainframes

New NAS mainframes positioned for price and performance challenges to IBM systems

	National Advanced Systems				IBM		
	AS/VL 40	**AS/VL 50**	**AS/VL 60**	**AS/VL 80**	**4381 Model 23**	**3090 Model 120E**	**3090 Model 150E**
MIPS*	5	7.5	10	17	7.3	7.5	15.6
Memory (in bytes)	32M to 128M	32M to 128M	32M to 128M	32M to 256M	16M to 64M	32M	32M to 64M
Price	$638,000	$891,000	$1.3M	$2.1M	$890,000	$985,000	$2.4M

Million instructions per second

CW CHART

OS/2 kit

to enhance the workstations of IMF economists. "Our related development is related to hooking PCs into larger systems," he said.

The IMF currently uses Microsoft Windows to provide a consistent interface for two different data bases, one on a Hewlett-Packard Co. minicomputer and the other on a Digital Equipment Corp. VAX. The IMF's micro organization, the World Bank, also uses a Windows interface to access a host data base.

OS/2 with the Presentation Manager interface will allow the IMF to have communications running in the background, remove the memory crunch and allow users to be constantly connected to more than one host computer, without interfering with PC applications, Semaarandeh said. All these applications can be addressed through the same interface, he added.

Touche Ross's McLoughlin said all in-house applications written in his department will eventually be converted to OS/2. But some may be difficult to convert. Most of McLoughlin's applications are written in Basic,

which is not currently supported in the OS/2 tool kit.

A key part of the migration to OS/2 is the compatibility box, which allows many existing MS-DOS applications to run but without taking advantage of additional memory. "Our stuff will run in the compatibility box," McLoughlin said. With the compatibility box, users can install OS/2 and retain the investment in existing applications.

Minis look like micros

A user at Westinghouse Electric Corp. has similar plans. "They will be able to be logged onto an IBM 3090 and a Data General Corp. mini and do local work," said Robert D. Wood Jr., associate systems analyst in the marketing services division at Westinghouse. In addition, Wood says he expects his department to put minicomputer-style applications on micros running OS/2.

Charles Weir, a systems analyst at Reuters, Ltd. in the UK, said he is also impressed with OS/2's capabilities. "OS/2 is the way things are going. It gives us extra memory and better task switching," Weir said.

Reuters developed a curren-

cy trading system that runs under Windows and replaces multiple terminals that traders formerly used. The company will eventually move that system to the Presentation Manager, according to Weir. Reuters has decided against Unix for its trading system. "The Unix graphics interface is suspect," Weir said.

Analysts contacted last week disagreed on corporate interest in OS/2 development. "The new IBM Personal System/2 design is a real computer design with a real operating system in the eyes of MIS. Companies are realizing they have a huge investment in PCs, and there is a lot of pressure from upper management to better utilize that investment, including in DP-type applications," said John McCarthy, research manager for "Forrester's Professional Automation Report" in Cambridge, Mass. "We are seeing the systemization of PCs."

But Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz., disagreed. "There is a lot of inertia in the old MS-DOS. A lot of users are not convinced of what OS/2 will do," Gruhn said. "Buying a $3,000 tool kit is not a major strategic investment for these companies."

Turbo gets toolboxes

SCOTTS VALLEY, Calif. — Borland International announced plans last week to introduce three Turbo Basic toolboxes for data base, editor and telecommunications development.

The developers' tools, which are slated to be available in the third quarter, include source code that can be incorporated into users' applications, according to the company.

The Turbo Basic Database Toolbox includes three sets of routines for data base programming: access, sort and screen display and entry.

It uses long integers for record numbers, permitting data bases of more than two billion records, Borland claimed.

The Database Toolbox also includes a Turbo Basic version of the Quicksort program and supports virtual memory management for an expanded sorting space.

Data can be imported from three types of files: Borland's Reflex, ASCII and Ashton-Tate's Dbase II and III Plus. The Turbo Basic Editor Toolbox comes with First-Ed, a multiwindow, multifile editor that is con-

trol-character driven, and Microstar, which is similar to First-Ed but has pull-down menus. Both editors are random-access memory based.

Supports windows

The Editor Toolbox supports multiple windows, multitasking and DOS functions like copy/delete file or change directory, Borland said.

The Turbo Basic Telecom Toolbox is said to provide the routines required to build a complete communications program.

It includes an asynchronous communications tutorial and routines for controlling ports and screen handling.

The package features two example programs: Smallcom, a simple program with basic modem control, and Turbo Telecom, a complete program with command line and script processing. Digital Equipment Corp. VT100 terminal emulation, Xmodem file transfer and a phone book data base.

The toolboxes are available for IBM Personal Computers and compatibles.

Borland said each toolbox will sell for $99.95.

COMPUTERWORLD

Information centers growing up

Survival depends on ability to better integrate center into corporation

BY ROSEMARY HAMILTON
CW STAFF

NEW ORLEANS — The information center fad is over. Now, many of these facilities are being forced to prove their worth, managers and consultants said last week.

"Three years ago, lots of peo-

ments to move away from their original — and very broad — mission of bringing computing to the masses and to zero in on a specific, high-visibility project that is sure to catch management's attention.

Of the 450 information centers recently surveyed by Crwth Computer Courseware, 32%

ple thought they better have an information center because they thought, 'The competition has one,' or, 'The guy I play golf with has one,' " said Larry Des Jardines, manager of user services at United Student Aid Funds, Inc. "But now we're getting looked at."

Many consultants at the Information Center Conference and Exposition, held here last week, suggested future survival depends on the information center's ability to market itself to the corporation. Some information center managers, however, said the key is for their depart-

reported that a chief obstacle is the ability to justify resources. When this survey was conducted two years ago, this question was not included because it was not an issue, a Crwth spokeswoman said. But when she surveyed 100 information center managers this year to help establish the questions for the 1987 questionnaire, "they made the suggestion that we include this issue," she said.

'A real hot issue'

At McCormick & Co., a specialty foods manufacturer in Baltimore, the end-user services or-

erage initial savings of $60,000 for the first month.

"Those types of systems get us enough visibility for management to say that we are a strategic part of the business," Carroll said.

Carroll also agreed with the marketing techniques and plans discussed by consultants and managers at many of the Information Center Conference's seminars. In addition to the special projects strategy, Carroll said that his department publishes newsletters on their achievements while also hosting luncheons and giving awards to information center employees.

User responsibilities

Not all information centers have taken the approach of tackling key projects and, as a result, their responsibilities are unclear and management resistance is an

by the United Student Aid Funds two years ago, he said, he was the information center. Consequently, he was strapped with the job of selecting hardware and software, installing it and bringing users up to speed with the systems. Eventually, Des Jardines brought on four analysts to work in his department.

"Some managers really don't have a good sense of what we're doing," he said. "Often we help someone else accomplish something, and they get the primary recognition. What we do is more intangible — you can't put production figures to it."

However, Des Jardines said that since 1985 his immediate boss has developed a clear understanding of his department. "We're not called on more than other departments to justify our budget, but the manager is now asking me more questions," he said.

Information center chargeback

1987 survey of 450 information centers shows majority do not have chargeback systems

3%
Abandoned

INFORMATION PROVIDED BY CRWTH COMPUTER COURSEWARES
CW CHART

ganization was launched at a time of corporate crisis, said Tom Artes, system application manager. A number of projects were behind schedule, and "maintenance was a real hot issue," he said.

The systems and project management group was formed to operate separately from MIS and to involve users in resolving these problems, he added.

One such project was an order-processing system that had been languishing for four years, according to Artes. His group was able to turn it around within a few months, he said. From there, additional projects, such as fourth-generation language use among end users, have been tackled.

'Redundant'

"Management gets responsiveness, so our budget has been there," Artes said. Recently, a productivity consulting group was hired to evaluate McCormick's information systems requirements. "They said we were redundant. But management did not agree," Artes added.

The information center department at Storage Technology Corp. took a similar approach, Ron Carroll, manager of the DP information center, said the firm's management recently saw the immediate results of an inventory-reporting system that was put together by Carroll and members of the information center.

The microcomputer-based system is being installed nationwide, and, as a result of this automation, Carroll said, each city that comes on-line shows an av-

Information center obstacles

Survey of 450 information centers in 1987 indicates end-user and management resistance are on the wane

	Lack of trainers	IS/DP resistance	Mainframe DASD shortage	End-user resistance
Inability to justify resources	Mainframe CPU shortage	Management resistance		

■ 1985 ■ 1987

INFORMATION PROVIDED BY CRWTH COMPUTER COURSEWARES

Revamp

amount of controversy now. I'm bracing myself," said X3J3 Committee Chairwoman Jeanne C. Adams.

She called the proposed changes in Fortran, which include the addition of array processing and derived data types, necessary modernizations of the language.

The X3J3 Committee also proposes to do away with what it calls duplicative or obsolete features of the language over an unspecified time period. That extended time frame has stirred little opposition, said X3J3 Vice-Chairman Jerrold L. Wagener of Amoco Corp.

IBM could not be reached for comment at press time, but Adams and the IBM representative's opposition was based in part on a desire to keep Fortran compact enough to run efficiently on a personal computer. The

array processing features are a sizable addition to Fortran, she said.

Negative vote

Boeing Computer Services' representative cast a negative vote because the company was looking for additional features in Fortran, such as bit data types and pointers, Wagener said.

Boeing Computer Services' Philips said his company was not ready to announce its stance in opposition to Fortran 8X. But each committee member voting against the proposed standard must put his reasons on the record, Adams said.

Unisys representative Larry Rolison charged that the committee strayed into designing a new language rather than standardizing features common to the best existing Fortran compilers. "We thought they added too much to the language," he said.

The opposition, while influential, "is equally split between those who say we've got too

much in the new standard and those who say we've got too little," Wagener noted. As a result, the X3J3 Committee "is in a tricky situation. To satisfy one of the groups will make the other one unhappy."

The situation reminds some observers of the dilemma faced by another ANSI technical committee when it attempted to get the new Cobol 85 standard accepted. Powerful opposition emerged during the public review process, challenging modernizations that would have required the conversion of the huge library of existing Cobol applications. Compatibility does not appear to be an issue in the debate over Fortran 8X.

Positive outcome

The X3J3 Committee's proposed standard is undergoing a 30-day letter ballot consideration by parent X3 Committee members, the positive outcome of which will allow the standard to be submitted for four months

of public review and comment. The opposition to Cobol 85 emerged during its public review period.

An X3 advisory committee has already forwarded both negative comments and proposed changes to the parent group, ANSI's Standards Planning and Requirements Committee, which checks procedural matters, took the step as a way of making certain that opponents get their point of view represented all parties.

"The negative comments are going to have an effect," said Wagener, an advocate of the new standard. But, he said, a solid two-thirds majority of the X3J3 Committee held together in spite of the disagreements.

The proposed changes, according to committee observers, include the following:

• Provide array operations or process sets of data simultaneously. This feature is already offered by several vendors of Fortran compilers.

• Provide an abstract means of specifying the representation of numbers, leaving it to the compiler to determine whether numbers should be stored as single- or double-precision figures. Commercially available compilers do not provide this feature.

• Provide derived data types, whereby a data type for employer-numbers, for example, could prevent an attempt to add employee identification numbers together, even if an application mistakenly called for such a result. This feature is another that is not currently available on Fortran compilers.

• Provide modular definitions, which allow a programmer to link the common elements of subroutines or other objects.

• Provide for the removal of obsolete, or so called "deprecated," features of the language at an unspecified future date. The deletions would occur with the full revision of Fortran that is set to follow the currently debated one.

Micom melds voice, data on 56K bit/sec. lines

BY ELISABETH HORWITT
CW STAFF

SIMI VALLEY, Calif. — A combination voice digitizer and digital multiplexer that Micom Systems, Inc. is expected to announce today reportedly provides voice and data integration over 56K bit/sec. dedicated circuits as an alternative for sites that cannot cost-justify a 1.5M bit/sec. T1 line.

The Onelinxer, by transmitting multiple data and voice transmissions over the same 56K bit/sec. dedicated digital line, brings voice and data integration to mid-range companies — Micom's target customers — that "often cannot afford T1 lines except as backbone networks," said Micom product manager Greg Iverson. "If you are doing more than 1½ hours of telephone calls between two sites, you save money by using a leased line, so many companies have one leased line linked to the private branch exchange [PBX] and another for data."

Most interface equipment that provides voice and data integration supports 1.5M bit/sec. T1 rates, according to Iverson, and many corporate sites do not have the voice or data traffic to justify installation of such equipment.

Voice conversion

Onelinxer incorporates Micom's new Advanced Packetized Voice technology, which converts voice signals into digital packets, permitting "high-quality voice" to be sent at rates of 9.6K or 14.4K bit/sec., Micom said. As a result, the multiplexer can support as many as four voice channels, or a combination of voice and high-speed data transmissions, over a single dedicated 56K bit/sec. link, according

to Iverson.

Industry experts questioned the market for 56K bit/sec. voice and data transmission. "I don't think many companies would bother to install 56K bit/sec. for voice and data when it only takes six 56K bit/sec. channels to cost-justify installing a T1 link," said Richard Kuehn, president of Cleveland consulting firm RAK Associates, Inc.

"A 66K bit/sec. Dataphone Digital Service [DDS] line is damned expensive," agreed William Rabe, a vice-president of the enterprise networking strategies group at the Gartner Group, Inc. in Stamford, Conn. However, Onelinxer would be

useful to a "data center that is using up most of a DDS line but wanted to slip in some voice bandwidth," or for companies that provide long-distance satellite connections, Rabe noted. "GTE [Spacenet Corp.] just announced a 56K bit/sec. full-duplex VSAT [very small-aperture terminal] that only costs $1,700 a month." Additionally, he said, the product could be used over satellite or transatlantic cable-based links between the U.S. and Europe.

Other products, or combinations of products, can reportedly provide 56K bit/sec. voice and data integration — although Micom seeks to differentiate its own product in terms of voice quality. Re-

public Telcom Systems Corp. in Boulder, Colo., reportedly offers a multiplexer and voice digitizer that supports six to eight voice channels or a combination of voice and data. In March, Timeplex, Inc. in Woodcliff Lake, N.J., began reselling this system under the name Link Packetized Voice Server-8.

General Data Comm Industries, Inc. also reportedly has a voice digitizer that sends 16K bit/sec. voice channels over a digital multiplexer.

Pricing for the Onelinxer Wideband Synchronous Time Division Multiplexer starts at $4,635. It can be equipped with an MT VM2 full-duplex voice digitizer module, priced at $2,940, and an integral 56K bit/sec. data service unit per channel service unit, priced at $1,250.

Ex-Intelsat head guilty of fraud

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Richard R. Colino, the former head of the International Telecommunications Satellite Organization (Intelsat), last week pleaded guilty to participating in a $4.8 million scheme to defraud the satellite consortium.

The complex scheme involved efforts by Colino and associates to obtain kickbacks from contracts for the financing and construction of Intelsat's new headquarters building here, according to court documents.

Colino, who was fired by Intelsat in December 1986 following a financial audit, faces a maximum sentence of 10 years in jail and a $250,000 fine after pleading guilty to one count of interstate transportation of money obtained by fraud. Sentencing is scheduled for Sept. 11 in U.S. District Court here.

Intelsat is a 114-nation cooperative that operates a global satellite system for telephone, video and data communications services. Colino, 51, was known for trying to turn the consortium into an aggressive competitor to meet the challenge of rival carriers using fiber-optic cable.

NCR Comten doubles 5620's power

Enters price/performance battle with IBM 3720, upgrades throughput, line support

BY ELISABETH HORWITT
CW STAFF

ST. PAUL, Minn. — Firing the latest salvo in a price/performance battle with IBM's 3720, NCR Comten last week announced an upgraded version of its 5620 communications processor.

The 5620XP model delivers between 2.2 and 3.7 times as much throughput power and supports twice the number of lines as the vendor's older model at a comparable price, according to NCR Comten.

Like the 5620, the 5620XP is designed to meet the communications needs of "remote sites in large, complex networks that may need to connect a variety of IBM and non-IBM terminals with a [Systems Network Architecture] backbone or non-IBM hosts," said David Anderson, NCR Comten's manager of marketing and planning.

The 5620 and 5620XP are "positioned against IBM's 3720 [communications processor], but the 3720 came after the 5620," Anderson said. A 5620XP equipped with additional communications subsystems supports 64 communications lines using asynchronous, bisynchronous or CCITT X.25 protocols. The implementation of two NCR Comten Integrated Protocol Converters allows up to 64 asynchronous devices to be attached to 32 of the lines, so that the device supports 96 channels in all, the vendor said.

"NCR Comten is trying to beat IBM to the 3720 punch," said John Carosella, an analyst at Fairfax, Va., consulting firm Network Strategies, Inc. "With the

spread of [IBM] 9370s and distributed processing, users are going to need network concentrators." An NCR Comten or IBM communications processor can accept incoming lines from multiple IBM hosts and multiplex them over a single leased line connection to a remote host, providing significant savings over multiple leased lines, Carosella said.

IBM's 3720 was introduced in May 1986. Models 1 and 2 support up to 28 lines; the 3721 expansion unit increases support to 60 lines. Models 11 and 12 support up to 14 lines and two IBM Token-Ring connections; 48 lines plus two Token-Ring connections with the expansion unit.

NCR Comten was unable to provide any benchmark figures comparing the 5620XP with the 3720 in terms of power.

An NCR Comten 5620XP, supporting up to 32 lines, is available now for about the same price as a comparable 5620 model, the vendor said. The base 5620XP model costs $16,000, with fully configured systems ranging up to $111,482.

An expansion feature that allows the 5620XP to support up to 64 lines will reportedly be available in the fourth quarter for $11,000.

Maintenance fees for the 5620XP are reportedly between 25% and 50% lower than previous NCR Comten 5620 fees.

Speedy 386 Unix debuts

BY DAVID BRIGHT
CW STAFF

SAN JOSE, Calif. — Convergent Technologies, Inc. last week introduced an Intel Corp. 80386-based multiuser Unix system and personal computer server that the firm claims is the fastest such machine on the market.

Convergent's offering, to be sold initially to OEMs and then to value-added resellers, will compete against 80386-based multiuser machines recently introduced by Altos Computer Systems, Prime Computer, Inc. and Texas Instruments, Inc.

Called the Server PC, the system is built around a 20-MHz microprocessor and is said to support as many as 36 PCs, 32 character-oriented terminals or a mixture of the two. The system can use Locus Computing Corp.'s Merge 386 software environment to simultaneously run Convergent's implementation of AT&T's Unix System V Release 3.0 and Microsoft Corp.'s MS-DOS.

According to marketing manager Henry Robinson, Convergent used sophisticated design features like a 64K-byte write-back cache memory with zero-wait states to build a very high-performing machine. The system uses a small computer systems interface (SCSI) disk drive controller to speed disk drive operation.

The Server PC is said to be compatible with the IBM Personal Computer AT. The box contains five 16-bit slots for PC AT add-in boards, three 8-bit PC-compatible slots and two 32-bit slots. Two of the 8-bit slots can also function as 32-bit slots.

A base configuration with a 1M byte of memory, an 80M-byte hard disk drive, an AT-compatible floppy disk drive and room for three additional SCSI peripherals is priced at $7,500.

Prime deskside set to challenge DEC

Potent 50 series system aims to give Microvax II run for money in price/performance arena

BY DAVID BRIGHT
CW STAFF

NATICK, Mass. — Hoping to strengthen its competitive position against Digital Equipment Corp.'s Microvax II line, Prime Computer, Inc. is scheduled today to announce its most powerful 50 Series deskside system.

Prime officials claimed that the addition of the new departmental 2455 system provides better price/performance and a better incremental growth path than DEC's Microvax II systems.

However, analysts termed Prime's argument "a little bit forced," because the Microvax's power can be increased through clustering and because DEC has a software advantage. In addition, DEC is believed to have in the works a Microvax III that would leapfrog the performance of the 2455, although it is unclear when that system would be announced.

While all of DEC's Microvax II ma-

quest, Inc., a San Jose, Calif.-based market research firm. With products like its All-in-1 office environment, which is built around the company's VMS operating system, DEC has an advantage over Prime, he said. "You can't fight VMS with price/performance," he added.

The 50 Series machines all use proprietary processors and the company's Primos operating system, although in late April, Prime modified its traditional proprietary strategy somewhat by introducing a Unix-based multiuser system built

around the Intel Corp. 80386 microprocessor. Mikita said that the 2455 announcement should reassure customers that Prime is still investing in its bread-and-butter 50 Series.

Like the entry-level 2350 and 2450 systems, the 2455 is said to be totally compatible with Prime's entire line of superminicomputers through the high-end dual-processor 23.5-MIPS 6550 machine. The 2455 uses a new CPU to boost performance by 23% over its 2450 sister machine. Internal cabinet changes leave

room for three 258M-byte hard disk drives, compared with two that were previously accommodated. The combination of the new processor and the revised cabinet brings maximum memory from 8M to 12M bytes. A 64K-byte cache memory with a 98% hit rate reportedly makes memory access more efficient.

A base configuration with 4M bytes of memory, a 258M-byte hard disk drive, a 60M-byte cartridge tape backup drive, four synchronous communications ports, a system console and a Primos license lists for $62,810.

Prime said the systems will be available immediately.

According to one analyst, a preconfigured DEC system would cost approximately $36,000.

> **"WHAT WE can do that DEC can't do ... is increase productivity by upgrading users to a more powerful machine while staying in this office-installable kind of environment."**
>
> MARY SCOTT
> PRIME COMPUTER, INC.

chines run at 0.9 million instructions per second (MIPS), according to analysts' estimates, Prime's three deskside systems range in performance from 0.85 to 1.6 MIPS. To obtain more performance, DEC customers must either link Microvaxes in networks such as Vaxclusters or jump to a much larger VAX 8250, which operates at 1.3 MIPS. The Microvax cannot be upgraded to an 8250.

"What we can do that DEC can't do is the same degree is increase productivity by upgrading users to a more powerful machine while staying in this office-installable kind of environment," said Mary Scott, Prime's product manager. "Clustering isn't right for everybody."

Different philosophy

But analyst Richard Mikita of International Data Corp., a Framingham, Mass.-based market research firm, said that in many cases, increasing performance through clustering can be just as practical as Prime's single-processor method.

"It's just a different philosophy," he said. "The DEC approach would be to provide those small increments of capability in multiple places, not to take a central processor and upgrade it in small increments." Therefore, he added, Prime's "steep-step argument is a little bit forced."

In order to better compete against the Microvax II, Prime needs to concentrate not so much on price/performance as on providing more applications that solve users' problems, stated Kimball Brown, who tracks the systems market for Data-

If You're Considering DB2,

If you're looking for the full power of relational technology, there's just one place to find it: SUPRA™ from Cincom®. Because no other DBMS gives you the advanced relational capabilities to reach such high levels of performance and productivity.

Not even DB2 from IBM®.

More and more companies with an eye for success are capitalizing on all-new, advanced relational SUPRA—companies like Hoechst, Heinz U.S.A., Best Western and over 150 others. And it's easy to see why. Each day they realize the rewards of the innovative *three-schema architecture* that enables SUPRA to soar above and beyond DB2.

SUPRA's advantages are clearly visible: Unmatched performance. Advanced relational implementation. Referential integrity. Integrated SQL capabilities. Entity integrity. Redundancy management. Automated data design tools. Dictionary facilities. MVS, DOS and VM versions. And more. Much more.

Product brainstorming marks AI conference

From software to systems, knowledge-based intros portray healthy growth in field

BY ALAN J. RYAN
CW STAFF

SEATTLE — Artificial intelligence developers attending last week's sixth annual conference of the American Association for Artificial Intelligence (AAAI) here had several products to choose from to enhance their job functions.

AAAI-87, which drew nearly 5,400 users, developers and others interested in AI, in held to further scientific and technological progress in the AI field.

Product highlights included Mountain View, Calif.-based Intellicorp's demonstration of its Knowledge Engineering Environment/C Integration Toolkit software, which it began shipping last week.

The software integrates programs written in C with knowledge-based applications developed using Intellicorp's LISP-based Knowledge Engineering Environment (KEE) system. The tool kit enables developers to move among C, KEE and LISP as necessary, depending on which programming language is most appropriate, the company said.

Intellicorp also demonstrated a deliv-

ery version of its KEE system running on Intel Corp. 80386-based personal computers. The KEE system reportedly allows individuals without substantial AI experience to develop their own knowledge-based systems. It runs on workstations from Digital Equipment Corp., Sun Microsystems, Inc., Symbolics, Inc., Texas Instruments, Inc. and Xerox Corp.

Commercial market tools

Teknowledge, Inc. announced plans to roll out a family of products designed specifically for developers of expert systems in mainstream commercial markets. The family includes the Copernicus Development Facility, the Copernicus Delivery Facility, the Copernicus Database Integration Facility, the Copernicus Cobol Integration Facility and Teknowledge Applications Packs. The rollout is likely to take place in the fall, with the introduction of the Copernicus core products and many of the family's optional features for DEC VAX, Apollo and Sun systems, the company said.

Gensym Corp. in Cambridge, Mass., demonstrated its real-time expert system for process control and related applications. Called G2, the system reportedly manages data in real-time environments and allows dynamic knowledge and rules to be represented. Prices for the product start around $36,000, depending on options and support.

DEC displayed the recently enhanced version of its VAX LISP software, its version of the widely used LISP AI programming language.

VAX LISP Version 2.2 is said to allow users to integrate AI techniques with existing systems. DEC offers an entry-level VAX system with an AI development language for less than $7,000. The same VAX system with a graphics-oriented AI development environment sells for less than $15,000.

Symbolics unleashes product load

As expected, LISP-based workstation maker Symbolics announced a series of hardware and software products at AAAI-87. The new products included the Cloe software package, which the firm said allows applications to be developed on Symbolics systems and delivered on 80386-based personal computers.

Symbolics also announced an 80386-based plug-in board designed by Norwood, Mass.-based Fountain Technologies Ltd. for Symbolics 3600 systems. The board is said to allow users to run applications under the Unix and Microsoft Corp. MS-DOS operating systems on the Symbolics 3600 series under the control of Genera, the standard Symbolics software system.

The Symbolics SNA 3270 software interface package, which allows Symbolics systems to connect directly to IBM Systems Network Architecture-based networks, was also announced at the show.

Symbolics said all of its new products are slated to ship by the end of this year or early 1988.

For companies breaking into the AI field, and for those seeking added potential in AI, Texas Instruments introduced three consulting options available through its Knowledge Engineering Services group. They are the Technology Application Assessment, the Application Prototype and AI Project Reviews.

The Technology Application Assessment was designed for companies that are beginning to explore AI or that want to develop a staff of knowledge engineers, TI said.

The Application Prototype reportedly provides customers with a system prototype that illustrates solutions to problems in a subset of a chosen application area.

AI Project Reviews offers a set of four-week, on-site meetings at which a senior TI knowledge engineer critiques the development process for the customer's knowledge-based system, according to TI.

Each consulting package costs $25,000.

Computer Associates cooks up data base add-in

BY DOUGLAS BARNEY
CW STAFF

SAN JOSE, Calif. — In hopes of boosting the position of its Supercalc 4 integrated spreadsheet, Computer Associates International, Inc. said it will offer a data base add-in product by early next year.

But even sooner — later this year — Computer Associates is expected to develop a version of the add-in for archival and market leader Lotus Development Corp.'s 1-2-3.

Computer Associates commissioned the project after realizing that the data base component of 1-2-3 is the second most used data base, right behind Ashton-Tate's Dbase III. "Many spreadsheet users use it for a data base, but the data base capability of Lotus [1-2-3] or Supercalc is not that strong," said Abraham Pumanski, president

of Computer Associates' microcomputer products division.

The products are currently under development by Eric Michelman, the original designer of Reflex, an analytical data base now owned by Borland International. The add-ins will run from within the spreadsheet environ-

ment and will be invoked through function keys or submenus, Michelman said.

Both Michelman and Pumanski declined to release details of the products, including whether they are at all relational or if they are simply file managers. Both men, however, described the add-ins as focusing on analysis and reporting capabilities. The products will use the interface of the spreadsheets they support. Pricing is not yet available.

Similar approaches

Computer Associates' approach to the spreadsheet market is highly similar to that of Lotus. Both firms offer a broad line of products that work with the core spreadsheet product. Lotus offers a natural language interface, desktop accessories, a report writer and prepackaged data. Computer Associates offers spreadsheet auditing, a collocation product and a utility for printing large spreadsheets sideways.

The approaches differ radically, however, when it comes to site licensing, networking and copy protection. While Lotus has announced intentions to release a network version of 1-2-3, the firm is far behind schedule. Lotus's software is copy protected, and no site licenses involving on-site duplication are available.

On the other hand, Computer Associates has aggressively sold unlimited site licenses. The company's product is not copy protected and is available for local-area networks.
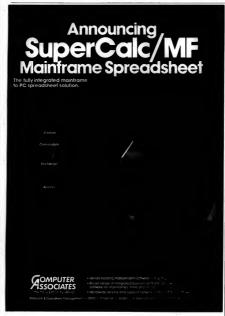

Announcing
SuperCalc/MF
Mainframe Spreadsheet

The fully integrated mainframe to PC spreadsheet solution.

Control
Consolidate
Exchange
Access

COMPUTER ASSOCIATES
The #1 growth company in the software industry

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframes, minis and micros
- Worldwide service and support network

Software & Operations Management • DBMS • Financial • Graphics • Spreadsheet

AT&T profits surge by 41%

NEW YORK — Although sales of its computers and telecommunications hardware continued to be sluggish, AT&T reported last week that strong revenue from long-distance services propelled the firm to a 41% surge in profits in the second quarter ended June 30.

AT&T also began to see benefits from its work force reductions of 1986. The firm said its expenses in the quarter declined 4.6% from year-earlier levels to $7.28 billion.

AT&T reported earnings of $596 million, or 55 cents per share, up from $422 million, or 37 cents per share, in the second quarter of 1986. Revenue was flat at $8.4 billion, compared with $8.42 billion last year.

The telecommunications giant said sales of office telephone systems, switches and computers rose just 1.5% to $2.5 billion. Services revenue increased 5.2% to $4.98 billion, and revenue from rentals fell 25% to $931 million.

CLINTON WILDER

14   COMPUTERWORLD   JULY 20, 1987

AT&T holds out carrot to SDN resisters

Dial-up access option makes service more affordable for sites without dedicated line connection

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — In an effort to beef up user demand for its Software Defined Network (SDN) service, AT&T announced a dial-up access option that makes the offering cost-effective for user sites that cannot justify a dedicated line connection.

SDN is geared toward large corporations with at least 20 sites that place 40% of their calls within the company, and it provides many private-network features over a dial-up network, said Glenn Starr, AT&T's product manager for SDN services.

While calls travel over AT&T's public-switched network, each calling location within a given SDN user community has a unique directory number

that is housed in an AT&T data base. The data base, which is unique to each SDN community, permits the AT&T system to provide call screening, user-defined routing and accounting for later billing purposes. A uniform dialing plan allows all users within an SDN community to call each other using a seven-digit number. The service is less expensive than private-line connections for sites that connections for sites that communicate less than 200 hours a month, Starr said.

Pricing in ballpark

SDN also provides private features comparable to WATS and AT&T's Megacom over ordinary long-distance dial-up lines, Starr noted. Recently, AT&T introduced a remote calling feature that lets people on the road dial into the SDN network and

take advantage of SDN pricing using a special calling card number.

Previously, a location could only become part of an SDN community through a dedicated link to the nearest AT&T office. The new tariff proposed by AT&T would allow locations to use the dial-up network to access the SDN network. In addition to a regular telephone number, the caller must dial in an identification number that tells the local carrier to route the call to a particular SDN trunk group on the AT&T switch.

The proposed tariff "is a logical extension of SDN that demonstrates AT&T's good faith that it isn't trying to get customers to bypass the local telephone companies," said Peter Bernstein, a senior research analyst at the New York consulting firm Probe Research, Inc. "It will

squeeze MCI Communications Corp. and U.S. Sprint Communications Co. just like everything else AT&T does, by making it easier for customers to access SDN."

The new SDN offering reportedly replaces a "standard switched-access" version of SDN that called for a dedicated line connection between the customer and the local carrier's central office and required the divested Bell operating companies to install special features on their switches.

Customers not interested

The AT&T filing reportedly said that the tariff could not be cost-justified because of an absence of customers. One reason for the service's lack of success is local carriers' refusal to support service at their central offices.

The tariff is scheduled to take effect Aug. 27, given Federal Communications Commission approval, AT&T said. As part of the same filing, AT&T established rates for dial-up SDN that are "slightly higher than their Pro America II rates," Starr said. AT&T also filed for a 6% reduction in SDN calls that originate over switched-access lines and are completed over special-access lines, or vice versa, and an 8% price cut for calls that are originated and completed over special-access lines.

MCI announced earlier this year a similar dial-up access feature for its V-net software-defined network service.

Both carriers' dial-up options are scheduled to be available in the same third-quarter time frame. MCI said it plans to file in August for V-net rate cuts geared to keep the service competitive with AT&T's SDN, according to MCI's director of network services, Steven Johnson. Sprint was unavailable for comment.

DEC offers doubled-up Microvax II

BY DAVID BRIGHT
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. recently announced a hardware-redundant computer system that consists of dual Microvax II systems and special software that runs under DEC's VMS operating system.

DEC said it is positioning the Microprocessor Implementation of a Reliable Architecture, or MIRA, system for dedicated control applications that require highly available communications with terminals, sensors and other computers. Targeted applications, which the company expects OEMs and value-added resellers to address, include message switching and manufacturing operations.

According to a spokesman, the system is not intended to compete with offerings from established fault-tolerant computer vendors like Stratus Computer, Inc. and Tandem Computers, Inc. "We don't see it as direct competition with anything," he said. "It's for people with a certain sense of criticality in their operations."

Operations are conducted on one of the Microvaxes, which functions as a master system, while the second machine serves as a standby. If the master system malfunctions, control of any attached devices will be switched to the standby unit.

Prices start at $66,820. Late summer availability is planned.

Gate links 3Com E-mail, IBM hosts

BY DAVID BRIGHT
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. and Soft-Switch, Inc. last week announced a software gateway that transfers electronic mail between 3Com local-area networks and IBM mainframes.

A week earlier, 3Com rival Novell, Inc. had introduced an electronic mail connection linking its networks with electronic mail systems on computers from Digital Equipment Corp. and other companies as well as on

IBM mainframes.

3Com communications products manager Peter Koolish said the key difference between the two methods is that Novell uses proprietary protocols, while 3Com uses IBM's Systems Network Architecture Distributed Services (SNADS) standard.

SNADS integration

"It's true that today, you can only connect directly from [3Com's] 3+ to the IBM Distributed Office Support System, but as time goes on, you're going to

see more and more people moving to SNADS," Koolish said.

The product, which resides on an IBM Personal Computer AT or compatible system, forms a direct link between 3Com's 3+Mail system and Soft-Switch's SNADS Gateway/MVS or IBM's Disoss on an IBM host computer running IBM's MVS operating system.

Through these mail-server connections, users of the 3Com system have the ability to exchange messages with other SNADS-based systems, including the IBM System/36 and 38, the 5520 and the 8100.

Efficiency the goal

Other Soft-Switch products can be used to route electronic mail through the IBM host to systems from DEC and Wang Laboratories, Inc.

However, using that method would not be as efficient as using a direct link, according to Michael Zisman, Soft-Switch's chairman.

Gateway licenses are priced between $3,000 and $5,000, depending on volume.

Availability is planned for late summer.

Airlines in dogfight over reservation system

BY DAVID A. LUDLUM
CW STAFF

Already sharpened as a result of recent mergers, the competition among airline reservation systems should climb to intercontinental proportions this week.

On Tuesday, a group of major European airlines is expected to make an announcement about bringing a U.S. partner into its efforts to build a sophisticated European reservation system, according to a spokesman for American Airlines.

The four European carriers — Lufthansa German Airlines, Air France, Iberia Air Lines of Spain and Scandinavian Airlines System — reportedly have been negotiating with American and Texas Air Corp. regarding participation in Amadeus, the European reservation system they say they plan to build.

Pressure on the Amadeus group to choose a U.S. partner escalated recently when a group of three other European airlines with rival plans to develop a reservation system announced that United Airlines would put its project. Incentives for the U.S. airlines include the prospects of replicating in Europe the considerable profits of U.S. reservation businesses, enhancing the capabilities of their U.S. systems and strengthening various joint marketing agreements with the European carriers through closer cooperation.

"It's basically to make some money," said Rob Doughty, a spokesman for United.

American's parent company, AMR Corp., operates the Sabre reservation system, which leads the U.S. market in travel agencies served. Sabre currently has about a 38% share of that market. The Apollo system operated by United's parent, Allegis Corp., is No. 2, with about a 25% share of the market.

System One, serving Texas Air's Continental Airlines and Eastern Airlines, has a share of about 11% but has been gaining modestly since Texas Air bought Eastern last fall, according to Wall Street estimates.

Equity retention an issue

The Amadeus negotiations revolve, in part, around the issue of whether a U.S. carrier would share in ownership of the system. "I suspect the decision will not depend solely on the quality of the software. Retention of equity in the venture could be a major source of contention," said Michael Friedman, a consultant with the New York firm Selig, Hellbraen & Eichner, Inc., which conducted a study on construction of a European reservation system for the Association of European Airlines (AEA).

American has put a multipart, menu-like proposal on the table and "will participate at whatever level makes them comfortable," said Joe Stroup, a spokesman for the airline. "If they want us to take a piece of the pie, we will do that. If they want us to be a software vendor, we will do that."

American sees reservation systems not only as the arms of an airline but also as successful businesses in and of themselves, Stroup said. "We are in the business of selling computer services and support. I think that's the Christmas tree, and everything else is going to be ornaments," he said.

Texas Air spokeswoman Eva Archer Smith declined comment on the specifics of the negotiations. "We are not discussing the fine details of the contract at all," she said.

This spring, in response to the expansion of Sabre and Apollo in Europe, the AEA commissioned the study on the feasibility of a joint European reservation system. While the results suggested construction of a single network, the two rival plans emerged.

The Amadeus partners are expected to invest $300 million, with IBM getting $140 million for use of its hardware. The system is scheduled to be in operation by mid-1989 and to break even financially by 1993.

"I'm sorry, Mr. Littleton. But when <u>they</u> offered me my own subscription to Computerworld, I took the job."

MRP scofflaws under DOD gun

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Department of Defense (DOD) deputy inspector general last week urged a tougher crackdown on defense contractors whom he said allow their manufacturing resource planning (MRP) systems to overcharge the government in an elaborate "inventory game."

The testimony by Derek J. Vander Schaaf at a congressional hearing was the latest development in an ongoing controversy over DOD audits indicating that the MRP systems implemented by many defense contractors do not comply with the Pentagon's cost accounting and contracting regulations [CW, May 11].

MRP systems, which regulate the flow of parts and assign costs in manufacturing plants, frequently make numerous inventory transfers in order to improve production efficiency.

Consequently, many MRP systems do not peg each part and its cost to a single contract, which is routinely required un-

der defense contracts.

At a previous hearing, the Aerospace Industries Association argued that Pentagon regulations are flawed and "out of sync" with modern manufacturing systems [CW, May 25].

The deputy inspector general, however, said Pentagon audits have uncovered cases of excess inventories, floating inventories not assigned to any contract and transfers of parts between government and commercial contracts.

Officials admit errors

At one contractor site, Vander Schaaf said, the auditors noted that about 1.9 million material transfers were made between government and commercial contracts during an 18-month period. Contractor officials acknowledged that for at least two years, their MRP system had not properly allocated the costs of parts to the contracts for which they were purchased, he said.

"Materials make up an estimated 50% to 75% of the costs associated with defense weapons systems at the point of final as-

sembly. With billions of dollars at stake, there is a tremendous incentive for contractors to practice what I call the 'inventory game,'" Vander Schaaf testified. He said the chief executives of defense contractors should be required to sign a document certifying — under penalty of law — that their MRP systems comply with Pentagon regulations. Companies that fail to certify their systems could be the targets of audits and could be penalized with reduced progress payments, he said, in order to put pressure on them to make their MRP systems comply with Pentagon regulations.

Vander Schaaf complained that his recommendation for certification was rejected by Pentagon management as premature while the Defense Contract Audit Agency conducts its investigation. However, he said the inspector general's office will be conducting its own year-long investigations of the problem.

Meanwhile, key members of Congress said they will push for the creation of a special task force to resolve the dispute.

Mac tools get revamp
Compatibility with Appleshare emphasized

CUPERTINO, Calif — Apple Computer, Inc. last week announced new versions of its Macdraw, Macwrite, Macproject and Macterminal software that bring those packages into compatibility with the Appleshare file server.

Each program now takes advantage of the features of Apple's Macintosh II and Macintosh SE personal computers, the company said.

Macdraw Version 1.9.5, which sells for $195, is said to be compatible with all versions of the Macintosh. It loads 20% to 75% faster than the older version of Macdraw and includes a zoom box in the title bar, a cancel button in the printing dialog box and additional command keys, Apple said.

Additionally, Macdraw is said to support up to 54 fonts and to offer what-you-see-is-what-you-get technique text.

Version 4.6 of Macwrite is compatible with Macintosh II, Macintosh SE and full-page monitors. It now supports arrow keys and uses a scaled ruler

Laserwriter ruler, according to the vendor. It sells for $125.

Macproject Version 1.2, which is compatible with all Macintosh systems with at least 512K bytes of memory, supports color when used with the Macintosh II, the company said. Its price is $195.

The Macdraw, Macwrite and Macproject programs will become the property of Claris Corp., Apple's application software subsidiary, according to Kyle Mashima, manager of Apple's software product management.

Version 2.2 of Macterminal is said to be compatible with the Apple Keyboard and Apple Extended Keyboard and updates the operation of the Enter key in IBM 3278 mode. It sells for $125 and should be used with the universal system and finder on the Macintosh Plus, Mac SE and Mac II, according to the company.

Macdraw, Macproject and Macterminal are available now. Macwrite reportedly will be available next month.

Ridge broadens low-end reach, supports System V

BY JAMES CONNOLLY
CW STAFF

SANTA CLARA, Calif — Ridge Computers last week announced AT&T Unix System V, Release 2 support for a new entry-level supermicrocomputer, which the company expects will expand its user base from technical computing into commercial applications such as software development and data base management.

The Ridge 32 Turbo/RX runs Ridge's RX/V, which is the System V implementation previously available on the company's high-end 3200 Model 95 supermicrocomputer. The 32 Turbo/RX effectively replaces the previous low-end Ridge 32/100 and Ridge 32/300. Those machines ran Ridge's Unix-like ROS operating system and remain available but are not being actively marketed, according to Ridge Vice-President of Marketing Larry Lunetta.

In addition to the System V support, the 32-user 32 Turbo/RX features 16K bytes of cache storage, compared with 256 bytes on the 32/100 and 32/300.

"Technical computing has been the traditional environment for Ridge, but we expect to move into new areas because we

are seeing more use of System V for things like time-sharing, software development and data base," Lunetta said.

Aims at lower, Power

The 32 Turbo/RX uses the same reduced instruction set computer technology as the 32/100 and 32/300 and is rated by the

dor at 2.3 million instructions per second (MIPS). Lunetta said the MIPS rating is based on comparisons between the speed at which applications run on the Ridge machine and on a 1-MIPS Digital Equipment Corp. VAX-11/780. Lunetta positioned the system against Unix-based systems such as the NCR Corp.

Tower series and the Computer Consoles, Inc. Power 6/32 series.

The 32 Turbo/RX is available with 4M to 32M bytes of memory, eight to 32 RS-232 ports, a 60M-byte cartridge tape drive and a 150M or 300M-byte hard disk drive. It has a base price of $31,900.

Ridge also said it recently has shipped the 3200 Model 95, announced in December.

The standard
by which all other monitors
are monitored.

Like most revolutionary products, the NEC MultiSync is based on a simple idea: Instead of one monitor for one board, why not have a single monitor compatible with all graphics boards. From CGA to PGC and beyond.

That simple idea has made MultiSync the world's best-selling color monitor and the undisputed industry standard.

MultiSync offers a maximum resolution of 800 x 560 for brilliant business graphics. And compatibility with old and new systems from PC/XT/AT to IBM PS/2 and Apple Mac II. It has a 14" diagonal screen, tilt/swivel base and 7-way text switch that lets you choose the color that's easiest on your eyes.

Best of all, it has one feature no one else can give you at any price: NEC. So why settle for monitors trying to equal the standard when you can have the one that created it. For literature or a dealer call 1-800-447-4700. For technical details call NEC Home Electronics (USA) Inc. 1-800-NEC-SOFT.

NEC

EDITORIAL

Merger mania

Item: "Borland to buy Ansa"
Item: "Competition thriving despite lessor buy-outs"
Item: "Merger giant swallows Uccel"
Item: "Fox Research scooped up by DCA"
Item: "Sale of D&B's Nomad2 imminent"

There's nothing unusual about merger and acquisition activity in business — except that the headlines above all came from *Computerworld* in the last two months alone. And, as the headlines indicate, the urge to merge and acquire cuts a broad swath across the entire industry, from large systems software to networking to leasing.

For companies like Broadview Associates, high-tech matchmakers specializing in software companies, business has been great. But for customers trying to cement purchase decisions and forge lasting ties with vendors, the frenetic pace of merger activity is producing big headaches.

Simply put, there's no way of telling what the impact of a merger is going to be on a range of issues, such as support for existing products, upgrades to those products and pricing of product lines, especially when a merger vests a company with a large market share in a particular line.

This is not to suggest that the impact of mergers and acquisitions is inherently negative. The biggest merger in the industry, the Burroughs Corp.-Sperry Corp. pact, has resulted in a $10 billion colossus that has shaved millions of dollars in administrative overhead — savings that can be passed directly or indirectly to customers. Similarly, IBM's purchase of Rolm Corp. has generally resulted in a more clearly defined direction for Rolm's product lines.

In the case of the recent $500 million purchase of Uccel Corp. by Computer Associates International, Inc., many questions have been raised about continued support by Computer Associates of Uccel's software.

The point to note is that Uccel users are actively involved in airing their concerns directly to Computer Associates and working with that company to spot potential problems. This strategy, vigorously pursued, is a trump card, because the vendor ultimately needs the continued support of the customer base a lot more than the collective customer base needs any one vendor.

Honeywell, Inc. users, for example, have extracted notable verbal commitments from Honeywell Bull, Inc. for continued support and enhancement of key product lines.

That the pace of merger activity will continue is almost assured by the dynamics of the computer marketplace today. For vendors, diversifying product lines is imperative to survival, and buying an existing player is easier and quicker than starting your own team in niche markets. And the stock market of the past two years has generated record stock prices, making outright purchases with company shares easier than ever.

But in the fiercely competitive computer markets, users have tremendous clout, especially in a merger situation. Use it.

LETTERS TO THE EDITOR

Innovation hits

I agree with much of what was said about innovation in the industry in "Innovation: Credit only where it's due" [CW, June 15]. However, I would like to point out a marked resemblance between the user interface of Apple Computer, Inc.'s Macintosh operating system and certain Xerox Corp. software.

I feel the Mac is an excellent machine, and its appearance has changed the market significantly, but it too has benefited from the sharing of ideas that is an important part of the industry.

IBM's Personal System/2 Micro Channel architecture is an elegant method of improving throughput without just going to faster clock speeds. I think this is a true innovation, but even if it is not, I would like to see IBM get credit for bringing it to the market, just as I would like Apple to get credit for its excellent development and marketing work.

Gary L. Katsanis
Rochester, N.Y.

Active participants

We were distressed to read the article about the development of a surgical information system at Rush Presbyterian-St. Luke's Medical Center [CW, June 1].

The various changes to the process of developing the system have participated fully from the project's inception. Years ago, we at Rush-Presbyterian endorsed the concept of decentralized systems development within the context of the larger computing and information systems environment. Integration of systems to the appropriate degree has been a key objective in systems development for a considerable time. We have

learned that the collaboration of our MIS group, which must recently has come to include administration of our AT&T Information Systems Network, is essential to systems integration, regardless of whether systems development occurs centrally within MIS or in the decentralized mode. The only real variable is the extent of involvement of the MIS group, not whether or not the MIS group is involved.

It is true that we have allowed decentralized computing over the years when noninstitutional funding has been used to support the respective efforts. In these cases, however, the developers of the systems concluded that they could function adequately for their limited purposes in a

free-standing mode.

We have worked hard and effectively to ensure that our 8,000 employees, many of whom are potential systems developers, understand the benefits of systems integration and the potential dysfunction associated with comparing "in a vacuum." We regret the disunity portrayed in the article. We remain committed to integration of our surgical information system into the larger information systems environment at Rush-Presbyterian.

Gordon B. Bass
Associate Vice-President and
Associate Administrator
Surgical Sciences & Services
Walter Menning
Assistant Vice-President
Associate Administrator
Data Processing
Rush Presbyterian-St. Luke's
Medical Center
Chicago

What bugginess?

I have a bone to pick regarding the headline "Users: 386 operating system buggy" [CW, June 22].

The article basically presents the following facts: The Software Link, Inc. shipped its first release of PC-MOS/386; 2,500 orders were filled in the first four weeks of shipping; and buyers of the first release will get a free upgrade. It also pointed out four well-received aspects of the product, two specific incompatibilities and the fact that we forgot to tell users about a special command required to use the Compaq Computer Corp. tape backup unit.

I did *not* see anything in the article to substantiate the idea of "bugginess." That is not to say

---

This week in history

July 18, 1977
Thousands of travelers in New York City are stranded after dozens of airline and hotel reservations systems go down when a lightning bolt knocks out a consolidated Edison substation and shuts off power at more than 3,300 computer centers serving more than 2.7 million customers.

July 19, 1982
The Federal Bureau of Investigation, reacting to allegations that Hitachi Ltd. and another Japanese company tried to steal IBM trade secrets, rejects a contract bid involving Hitachi-manufactured mainframes in favor of IBM's higher priced machines.

A portrait of the artist as a PC

Contemplating the future of desktop publishing as its software swells

JOHN KIRKLEY

Aesthetic anarchy.

That's what will happen when everybody becomes their own art director, and we are inundated by tidal waves of memos, letters, pamphlets, reports, monographs and books prepared on the desktop publishing systems that are spreading through American business like the Andromeda Strain.

Armed with a seemingly infinite number of typefaces and able to reproduce pictures, charts, old woodcuts, contemporary clip art — in short, images culled from everything from *The Book of Kells* to the Sunday comics — workers in corporate America may go on a binge of typographic elaboration and decoration that will make the Baroque period pale by comparison. And they may do so unencumbered by considerations of taste or even the most basic sense of design.

One might argue that desktop publishing systems are not that widespread. A personal computer, some sophisticated software and a laser printer make up a capital expense that is not to be sneezed at. And yet, if well established technological trends continue, system prices will continue to plummet and capabilities increase.

It is also a good bet that desktop publishing will begin to lose its individuality in a few years as greater graphics capabilities are built into inexpensive software packages aimed at the general office information systems market. Adding to this merging of the technologies is the capability of IBM's PS/2 machines with their high speed, wide bandwidth and internal data buses capable of handling true compound documents.

Some industry observers see corporate desktop publishing going through the same cycle as did the PC: initial widespread bootlegging as users seek to bypass cumbersome service departments, followed by altered reaction from top management and a call for control.

Maybe so. But the hard-door

Kirkley, a former editor of Datamation *magazine, is an industry consultant currently acting as editorial adviser to Patricia Seybold's Office Systems Group. He is based in South Nyack, N.Y.*

is already open and Aldus Corp., Adobe Systems, Inc. and others are fueling the fires of user-generated publishing.

Now at this point you may wonder if I'm not indulging in some sort of aesthetic snobbery. Eyeglasses in hand, scented handkerchief to the nostrils, we watch in horror as the unwashed masses invade what was once the sacred realm of a highly trained technofront of graphic artists.

Could be. Perhaps what is really happening is that there is about to be a modern-day publishing Renaissance characterized by an elevated sense of style and a sensitivity to the enhanced communications possible when form and content are melded into one. Perhaps the general

BILL RUSSELL

designer. He attempts to distill, in some 60-odd pages, the fundamentals of page layout, the grid system, use of headlines, graphic images, borders, rules and even such niceties as kerning and dealing with widows and orphans. It's a good little book, a foretaste of what's to come.

Corporations are not very keen on anarchy of any kind. They thrive on regularity, convention and standardization. "I don't like surprises," is a management staple response. When it comes to graphics, managers often spend great quantities of money to create a distinctive corporate look that extends from the annual report to the logo on the back of the company's bowling shirts.

Those concerned with mat-

level of artistic expectation will rise to where not only the workplace, but our entire environment, will be permeated by an impatience with the crass and the ugly. There could be a universal demand for the creative, the subtle, the artistic — an acknowledgment and extension of the Bauhaus ideal that the design of everyday objects reflects the highest aesthetic merging of form and function.

Sounds great. But what is more likely is a hodgepodge of graphic experimentalism spewing out of myriads of desktop systems; attempts to squeeze five columns of type into an 8½-in. wide sheet of paper; using six different type fonts in one memo; overwhelming the written message with an excess of pictorial decoration.

Aldus, the Seattle company that helped accelerate the desktop revolution when it introduced Pagemaker in 1985, has taken a step toward bringing good basic design concepts to the average user. When you buy its package, you get a little book called *The Aldus Guide to Basic Design*, written by Roger C. Parker, a professional graphics

ters of corporate image — corporate executives and the corporate communications folk — will first be appalled and then spurred into action when they realize that all manner of correspondence is being issued in the company's name by a work force equipped with both desktop publishing systems and their own wildly individualistic sense of what constitutes good graphic design.

What will they do? Issue standards, of course, much like the restrictions now imposed by management regarding the acquisition and use of PC hardware and software within a company. Very simple, if you're an IBM shop, you don't buy from Apple Computer, Inc. If you're a stylistically conservative Helvetica and Times Roman typeface kind of corporation, you will not tolerate demented excursions into Balloon Bold or Weiss Italic by your employees.

And so, after a period of ferment, desktop publishing will be folded into office systems, and there will be corporate handbooks dictating which typefaces will be used under what circum-

Modern marketing's love affair with AI

A catchall term promotes "gee-whiz" products

HARVEY NEWQUIST

Welcome to the world of artificial intelligence exploitation.

People often ask me why I chose a field like artificial intelligence to write about. After all, most people think AI stands for artificial insemination, which makes for a lot more office jokes than artificial intelligence does.

Well, first of all, I don't have any kids to ask me probing questions about the desk drive industry, and I don't have a regular barber to help me better understand the semiconductor industry. I just think AI happens to be a fairly intriguing, fairly new technology that is finding its way into a variety of practical business applications. And there are a lot of companies doing some incredible things with it: American Express Co., Citicorp, Travelers Insurance Co., Procter & Gamble Co. and Ford Motor Co. to name a few.

Unfortunately, there are other companies doing some less than great things with AI — which brings us to the subject of AI hype.

One of the things that continually amazes me is how many groups use the AI tag to promote their products simply because they feel that it's enough of a "gee-whiz" term to get people to buy something. Let's run through some examples.

A very large dialectic company (which shall remain nameless, but they make excellent tapes and diskettes) has been running a full-page ad in personal computing magazines that shows a pair of robots (a la C-3PO of "Star Wars") operating on a third robot. One robot is hunched over the patient; his name is obviously Igor. The other is holding aloft a diskette surrounded by various electrical sparks and pyrotechnics in a scene right out of "The Bride of Frankenstein." The headline reads, "Give the gift of intelligence. Free." The ad goes on to say that specially marked boxes of this company's diskettes contain *free* AI software, a $200 value. Get that? $200 worth of artificial intelligence for free.

First of all, that "specially marked box" stuff belongs on the cereal shelves of supermarkets, where you can get away with

Newquist writes and consults on artificial intelligence and other advanced high technology topics from his office in Scottsdale, Ariz.

promises of big things inside the box because the average user is a 4-year old.

Second, I can just see some young, enthusiastic engineer running into the executive lunchroom with a new package of these diskettes yelling "Boss, look! Now our company can use real artificial intelligence with only a $20 investment! Isn't that great?"

You might laugh at this scene, but don't think it won't happen.

Consider another example. A relatively new startup company has invented an electronically interactive weight-training machine, which is sort of like "Robbie Meets Nautilus." Based on information it stored in previous workouts and just how frequently you use the system, the machine keeps track of your progress during a workout. But get this: The company claims that the system uses artificial intelligence to perform these functions.

AI and the ego

Imagine what artificial intelligence could do to a person's ego at a health club. Incorporate some expert system technology, a little voice synthesis and recognition, and voila! You get the following scene:

"Hello, Dana. Long time, no see. Probably too busy to exercise that far-from-perfect body of yours, right? Well, not to worry. My knowledge base says you've paid your membership in full until 1988, so we have your money anyway. OK, come sit over here on the leg-lift chair." Sufficiently humiliated, Dana lowers himself onto the artificially intelligent seat.

"Good God, Dana! What have you been doing for the last three weeks, four days, nine hours, and 52 minutes? Are Twinkies the only food in your diet? You've gained 1.2 kilograms! Have you no pride, no discipline? You must have blown your last paycheck on discount chocolates. Well, no matter, we'll take care of you. Let's start with 300 leg lifts. One, two . . ."

Yet the winner in the AI hype club, surprisingly, is IBM. During a series of TV advertisements last year, IBM demonstrated the wonders of its voice recognition system by having a woman dictate into her computer the words, "Mrs. Wright, write home right now."

Guess what? The video screen printed up each word immediately and correctly — spelling, grammar, punctuation, ev-

Love affair

erything. And guess what else? The voice system isn't available to the public. IBM doesn't even sell it, because it's not a product. It's still in the research stage, and there are no plans to market it in the near future. And don't believe the machine responds as fast to the spoken word in real life as it did in the TV ad.

To be fair, using AI to generate consumer interest isn't limited to business products; it has even extended beyond primetime TV to prime-time television shows. Who could get away with using AI to gain ratings points? The answer is the perfect combination of computer technology and cynical hucksterism: Max Headroom.

In one of the early episodes, Max confronted the computer named A7 that controls and manipulates at will the personnel files of the world's citizens. How can a computer do such horrible things? Because it is an "artificial intelligence computer," Max learns. But on TV, as in real life, higher reasoning triumphs and A7 ultimately falls victim to artificial emotion.

Many of the successful vendors of AI-based products have taken to referring to their products by the specific area of technology, such as expert systems, natural language, machine vision and so on instead of using the term artificial intelligence. AI has come to be a catchall name for all those technologies that attempt to emulate some area of human behavior, but that doesn't mean it's the most appropriate name.

Bugginess

that bugs do not exist — we know of some specific bugs and incompatibilities, and nobody in this business would expect differently from any product, much less an operating system (hence the free upgrade). In fact, we have shipped more than 3,000 PC-MOS/386 packages to date, and only 14 customers have taken advantage of our 30-day money-back guarantee. Feedback has been overwhelmingly enthusiastic.

I know that CW is a fine product, even if there is an occasional glitch. Your readers should know the same about PC-MOS/386.

Rod Roark
Director of Research and Development
The Software Link, Inc.
Atlanta

Questions data

I read the article about Datapro Research Corp.'s survey of mainframe user satisfaction [CW, June 22] with interest. If IBM's System/38 does deliver the highest satisfaction rating in the survey, that is critical to our firm, which specializes in software for that buys product. We do not question that the System/38 can deliver that satisfaction, but we do question the validity of that data on which the survey is based.

If one looked at the data, he might assume that Hewlett-Packard Co.'s HP 3000 users were the most numerous in the field, followed by Wang Laboratories, Inc. VS users and NCR Corp. 900 ITX users. This would be concluded because 37.7% of the respondents were HP users, 22.2% were Wang and 15% were NCR users.

Imagine the surprise to learn that the survey represented different sample sizes from each group. Based on Computer Intelligence data in January, the survey responses covered 8.4% of all NCR users, 3.8% of Wang VS users and 3.8% of Unisys Corp. B 1900 users. The responses also covered 0.6% of System/38 users, 1.4% of Digital Equipment Corp. VAX II users and 0.1% of IBM System/36 users.

There are many reasons for changing rates in a survey. Such variability of sample sizes means that you cannot make any statistically valid inferences about differences in overall satisfaction levels between users of various vendors' hard-

Portrait

stances and how graphics are to be included on the printed page. How flexible these guidelines will be will depend on the individual corporate culture.

So another revolution will have been quashed. Art direc-

tors will ply their trade in peace once more. Conventions and stability will be the order of the day.

But just as the corporate arbiters of taste sigh in relief, somewhere out there, inexpensive video communications devices are being designed.

Think of it: every worker a video director, a producer . . . yes, even a star.

There is a redeeming lesson, though. Scanning the data, one would notice the range of overall satisfaction scores was pretty high. From that, one might conclude that minicomputer users were a fairly content lot and that what matters is not the hardware vendor but rather the suitability of the software to the task at hand.

Mark Lieberman
Vice-President of Marketing
Friedman and Associates, Inc.
Deerfield, Ill.

Ahead of time

John R. Vacca's article, "AI diagnoses MVS ailments" [CW, June 8], destroyed its credibility in the first sentence. "Twenty years ago, operators of IBM's MVS operating system provided both problem-handling expertise and control over the normal allocation of computing resources."

In 1967, MVS was not even imagined. IBM still regarded virtual storage as a blue-sky technique, not one appropriate to its mainstream product line. IBM was still struggling to get OS/360 to work reliably and had no inclination to fund a massive rewrite.

The only paging software that IBM released in the 1960s was in support of the 360/67. CP/67 was originally a pair of research projects on a modified 360/40; this is the system that evolved into VMF/370 and into MVS/SP and VM/XA and had nothing to do with the development of MVS. Time Sharing System (TSS/360) was a sophisticated system that, in many ways, was

superior to MVS (especially with the TSS/370 RPQs) but again was not an ancestor to MVS.

During the 1960s, IBM was considering the development of Low End OS (LEOS) and had decided that it did not have the resources to develop both LEOS and OS/VS. So not only was MVS not around 20 years ago, but there was not even a commitment to develop it.

Seymour J. Metz
Annandale, Va.

Filling wish list

I found the roundtable on Cobol code restructuring [CW, June 29] one of the more insightful summaries on the state of the art in this area to date.

Among the issues — or wishes — raised were the need to understand the code, deal with other types of code and dialects, be able to run on different machines, bridge to other tools, such as code generators and fourth-generation languages and document the code and support the maintenance programmer as he maintains the code.

Meta Systems Reverse Engineering's approach addresses all of these needs and more. By abstracting the code to a higher level language encyclopedia, which runs on most computers and operating systems, all of these wishes can and have been met by our current customers.

Richard J. Welke, Ph.D.
President and Chief Executive Officer
Meta Systems Reverse Engineering
Ann Arbor, Mich.

SOFTWARE & SERVICES

A better DSS benchmark

Many measures of the performance of decision-support software (DSS) exist the number of transactions per second, but the nature of DSS processing is not oriented toward transactions. I would like to propose a measure that is more relevant, one that considers the number of active end users.

The decision-support world is one that is typified by long reports, ad hoc analysis, unscheduled and unstructured processing and so forth. The very nature of the decision-support world is one of unpredictable processing. End-user computing is often synonymous with decision-support processing, where the long-term directions of the enterprise are being considered. Transactions are not the norm for most decision-support processing. Certainly transactions can be run in a DSS world, but they are second-class citizens compared with the more normal processing that occurs.

These "more normal" processing typically include:
- Reports — summaries of activities, events and so on.
- Merges — "relational joins" of data bases in order to create meaningful Cartesian products.
- Extracts — analysis of subsets of data.

Continued on page 26

Users praise frame technology

Say method saves money, increases flexibility in Cobol programming

BY CHARLES BABCOCK
CW STAFF

Users of a development method called "frame technology" say it gives them an inventory of reusable Cobol parts from which they can construct applications in a speedy, assembly line-like fashion.

Sold under the trade name Computer Automated Programming (CAP), the development method involves both modules of reusable code and a skeleton control process for calling these modules and linking them together.

CAP is a product from Toronto-based toolmaker Netron, Inc. and has been available since 1983. It is said to be able to produce mainframe Cobol source code from a system that works on either an IBM mainframe or Personal Computer, a Digital Equipment Corp. VAX or a Wang Laboratories, Inc. VS minicomputer.

Gains acceptance

CAP's acceptance at the marketplace has been slow, but two prominent users say it has become an accepted development method in their shops.

"We see a potential 50% savings [in the cost of application development]. We can generate 80% to 90% of an application from standard frames," says Bernard Keroes, head of the corporate augments department of information management for The Hartford Insurance Group.

The developer of the technol-

ogy, Paul G. Bassett, vice-president of research at Netron, says CAP's main benefit is its flexibility in the hands of programmers. But users report that they like the amount of code they can generate without resorting to custom programming.

"Eighty percent to 85% of the time, we can go with just those frames," says Dale E. Novotnak, supervisor of systems and programming at Koppers Co. in Pittsburgh.

How CAP works

A Netron customer receives 30 modules of code and a development process that invokes the modules from a strict hierarchy.

At the bottom of the hierarchy is a set of generic frames containing code that can be used with many applications to control such things as screen formats, I/O controls or the retrieval of information from a field, according

to Bassett.

At the top of the hierarchy sits the specification frame, which contains the custom parts of the application written by a staff programmer.

Included in that frame is a method of calling lower level frames for parts of the application, Bassett explains.

In between the specification frame and lower level frames are

Continued on page 24

Netron frame hierarchy

INFORMATION PROVIDED BY NETRON, INC.

Graphics for MVS

Computer Associates offers reporting option

GARDEN CITY, N.Y. — Computer Associates International, Inc. is offering graphics reporting with its IBM MVS operating system utilities as a direct spinoff of its acquisition last year of Integrated Software Systems Corp.

The $5,550 Graphics Reporting Option was designed to work with CA-Unicenter, the vendor's package of operating system utilities allowing greater automated control of the data processing center.

The Graphics Reporting Option also was designed to work with the CA-Top Secret security product, CA-Jars job accounting product, CA-Dynam/TLMS tape library manager, CA-Dispatch report printing and distribution product and CA-Scheduler production scheduling system.

System operators can use the graphics reporting option to depict what they deem to be critical information in bar charts, pie charts or plex graphs, said Michael Guido, president of Computer Associates' Systems Products Division.

Frames

mid-level frames that assert various degrees of control over the application.

Some of the frames can be modified by a staff programmer to fit a particular application, although the CAP library version will remain untouched.

"A mid-level frame might understand how to process a transaction, grabbing information from a screen and throwing it out to another frame for error checking," Bassett says.

Each frame contains what might be described as a subroutine or module of reusable code, but it actually differs from both of these.

Unlike a subroutine, a frame can be used with many applications.

"A frame is like a generalized engine for many tasks. A frame looks for variations across many subroutines, then you tailor it for the use you want," Renois says.

Unlike a module of reusable code, a frame is not static. It can contain several variations of a procedure, with some higher frame in the hierarchy tapping the correct variation for the application, Bassett says.

Because the staff-written code in an application is contained in the specification frame, maintenance effort is focused there. Typically, the specification frame contains 10% to 20% of the application, users say. "We have reduced the area of maintenance by a considerable margin," Renois says.

CAP has procedures and command statements that require two to three months of training, according to Koppers' Novotniak says. The frames contain variable names that refer to the next frame to be invoked. "I would use MAINT ST1 to call a standard subroutine," Novotniak notes, adding that the reference can be altered by inserting the name of another frame in its place.

Break points can also be inserted into a frame to allow for the addition of data or other custom programming procedures, he says.

Add frames cautiously

Customers may add their own frames to the set that Netron provides, but both users say such additions should be made with restraint.

"Some people here have math degrees and have thought up things to put in frames," Novotniak says, but only general-

Paul G. Bassett

ized, error-free code should be allowed to become a frame.

"We say additions should be things that are unique to The Hartford," Renois adds.

Big plans for training

Since February, Renois' shop has trained 20 of its 1,100 programmers and analysts to use CAP in pilot projects. It plans to have up to 100 of its staff members trained by the end of the year, Renois says. The company has used frame technology to move an application from a VAX to a VS, and the effort "took half the amount of time we thought it would," he says.

Novotniak's shop has trained 30 programmers in CAP during 1½ years, and he says it plans to train half of its Cobol staff. Koppers is using it to develop general ledger, payroll, accounts payable, inventory and sales and orders applications that are tailored to each of 13 plants.

"At our Georgia plant, we put up an invoice system — a sample system with 100 programs — in five days. We worked 16 hours a day, but we were able to go live with it a month later," Novotniak says.

The CAP approach can be used for CICS applications because specific frames invoke command-level instructions, Bassett says.

DSS

• Trend monitoring — tracking of summarized data time.

The majority of the activity that occurs in the decision-support environment characteristically involves bulk data processing. As a consequence, the transaction processing rates that can be achieved in a decision-support processing environment do not provide a meaningful benchmark.

Instead, I would recommend "active end users per million instructions per second (MIPS)" as a meaningful benchmark criterion for DSS software.

An active end user is an end user that is logged on or otherwise actively processing decision-support activity. The end user may be doing a wide variety of tasks, such as specifying work to be done, analyzing results or actively causing the processor to do heavy execution. A MIPS increment is, of course, the standard hardware measure of power. Dividing the active end users by the MIPS rate minimizes the disparity of one end user community operating on an IBM 4381, and another end user community operating on an IBM 3090 Model 200.

While, under controlled circumstances, the active end users per MIPS for a hardware or software configuration may prove to be a useful figure, there are many inequities under uncontrolled circumstances.

'Normalize' work loads

For example, one of the big disparities in the decision-support environment is in the work load being processed. One set of users in a busy analysis on data bases that contain, on the average, one million records. Another set of users is doing analysis on data bases that contain, on the average, 10,000 records. Even if the algorithms used are identical, the resources consumed in the two environments will not be. Total and average data base sizes then are one variable that must be "normalized" from one environment to the next in order for active end users per MIPS to be meaningful.

Another variable that must be normalized is the nature of the work being done by the end user. One set of end users is doing heavy data base processing — sorting and merging several tables together. Another set of users is accessing small subsets of data selectively from a data base and doing individual analysis based on those subsets. Even if the size of the bases of data are the same, the first

set of users will use far more resources than the second. The processing between the different groups of data needs to be normalized before active end users per MIPS becomes meaningful.

Still another factor that must be normalized is the nature of the processing that is occurring. One group of users is doing massive update processing, which requires a fair degree of internal control of data to maintain data integrity. Another group of analysts is doing pure access

RELYING ON one of the standard benchmarks for comparison may produce very biased (and, to the interested organization, incorrect) results.

and calculation only — where no update integrity control is required. All other factors being equal, the first group of analysts will require many more resources than the second.

It is clear, then, that there are many variables that must be taken into account if active end users per MIPS is to be a meaningful figure.

One approach to normalize the work load is to create a standard work load that can be run in a number of environments.

There have been some benchmarks for the DSS environment that lay the foundation for a standard work load. These benchmarks are definitely a step in the right direction. But, strictly speaking, the benchmarks are only valid for environments that mirror the benchmark.

In other words, if an organization is interested in DSS performance and has a work load that is not represented by one of the standard benchmarks, then relying on one of the standard benchmarks for comparison may produce very biased (and, to the interested organization, incorrect) results.

Inmon is a senior principal with American Management Systems in Lakewood, Colo., and an author on the subject of data base design.

NEW PRODUCTS

Systems software

A Wang Laboratories, Inc. VS computer series-based integrated authoring system designed for creating computer-based training courseware has been announced by BEI Corp.

Combat features response analysis; case insensitivity; wild card, punctuation and blank character stripping; conditional judgment; frame-logic GOTOs and external branching; automatic and author-initiated student response recording and scoring with management reporting; and two levels of bookmarking.

Software pricing is tiered and follows Wang's A, B and C CPU classifications. A class B license costs $11,000.

BEI, 2921 Eastlake Ave. E., Seattle, Wash. 98102.

A VSAM catalog information and reporting system for IBM and compatible mainframes has been introduced by Goal Systems International, Inc.

Mastercat/VSE is said to allow users to view all VSAM catalog information on-line and create customized batch on-line facility provides VSAM catalog reports that list only the catalog information selected by the user. Mastercat/VSE's

data in packets, eliminating the need to search through Listcat reports for information. The batch-reporting function lists all VSAM information about all clusters in all catalogs, with only three control cards.

Mastercat/VSE is available for $3,920 under a permanent license or $98 per month under a three-year renewable license.

Goal Systems, 5455 North High St., Columbus, Ohio 43214.

Applications packages

Shop Floor Control, a module designed to control the flow of work on the factory floor by keeping track of materials, operations, labor and tools, has been added to

MCBA, Inc.'s line of Digital Equipment Corp. VAX Cobol software.

The 18-module accounting, distribution and manufacturing system, which runs on all VAX computers under DEC's VMS, makes up a closed-loop Manufacturing Source Planning system.

Functions of the Shop Floor Control module include fully customized shop orders; creation of shop orders by copying associated Bills of Material and Routings; set-up of repeat orders through Base Order and Order Copy facilities and reports such as status and exception.

The Shop Floor Control module costs from $4,500 to $9,000.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

Utilities

A turnkey login package for Unix, called Golden Key, has been released by Goldleaf Computer Systems.

Golden Key is said to allow users to set up a Unix system to perform as a turnkey system. Login and password, according to the vendor, become a function of the application software. The menu-driven software also monitors certain areas of the system such as file sizes and disk fragmentation to relieve the need for system administration.

Golden Key knows when the terminal is turned on, sets up I/O control, handles all need functions and executes the application assigned to that terminal.

Golden Key is priced from $99 for one-to four-user systems to $419 for more than 20 user systems.

Goldbar Systems, P.O. Box 2686, 3326 Transit Ave., Sioux City, Iowa 51106.

Development tools

Cform, an application development environment used to work on microcomputers, minicomputers and mainframes with most operating systems supporting a C language compiler, has been announced by Consure Computer Services, Inc.

Cform is said to use a set of visual forms-oriented applications tools. Aspects of the application are defined by creating for ms and answering questions in dialog boxes. Data bases are inferred from forms and do not have to be predefined.

Other features include a data dictionary, in which all data elements are centralized, and the ability to cross-reference data from one form with data from any other form. Also, a programmer may write in C at any level in the development process.

A Cform starter license costs $295. A license including a runtime module costs $595, and a developer license, including C language libraries, costs $995.

Consure Computer Services, P.O. Box 235, Chatham, N.J. 07928.

HERE, WHEN, OR WHY... HERE'S HOW:

BASIS systems are easily implemented, becoming quickly productive. And, that makes sense.

One of the best benefits of selecting BASIS for your TIMS is the ease with which BASIS can be implemented and tailored to your existing application environment. And, as many MIS/DP managers have discovered, BASIS even provides applications opportunities for end users, thanks to BASIS' fully integrated applications development facilities. Once implemented, BASIS databases are easily modified without disrupting systems operations. New files and record fields may be added or changed without reloading data.

BASIS is accurate, efficient, and secure.

Password protection and privilege code access secure BASIS installations at the database, index, record and field levels, to satisfy the most particular confidentiality requirements of your databases.

If you like what BASIS can do for you, wait until...

BASIS TEXT INFORMATION MANAGEMENT SYSTEM. HIGH TECH. IN TOUCH. VERY USER-FRIENDLY.

IDI is the first relational DBMS with full-text handling capabilities integrated with complete database management facilities. IDI provides superior integrity constraints, security features and maintains data independence for programmer independence in DBMS development.

BASIS and IDI are both products from the minds of Information Dimensions, Inc., a subsidiary of Battelle—since 1929, the preeminent independent research facility in the world.

This proud heritage is your assurance that the BASIS and IDI systems are truly representative of the most innovative development in software technology available for TIMS and DBMS applications. And, Information Dimensions provides a network of marketing, technical services and development, with efficient and pronounced worldwide.

If you consider how simple, how strong, how smart BASIS and IDI are, you realize that for text management, you need look no further.

Information Dimensions, Inc.

The SAS System
Power Behind Every Window.

If you're "window shopping" for software that's both powerful and easy to use, take a look at the SAS® System for Personal Computers. It's got everything you're looking for...and more.

1 **Ease of use.** The SAS System has ready-to-use procedures for every kind of analysis and report—from simple to advanced, preformatted to customized. There's even a built-in menu system to guide you through the procedures, and on-line help is always available. Special windows let you define titles and footnotes for reports, check the characteristics of your data, change function key definitions, and keep notes.

2 **Connectivity.** With the SAS System for personal computers, you get a built-in link to your host SAS System. You can download corporate data; develop, test, and run applications on your PC; or move data and applications back to the host for execution. Plus the SAS System reads data from any kind of file, including dBASEII,® dBASEIII,® and Lotus® 1-2-3.®

3 **Integration.** The SAS System runs on mainframes, minicomputers, and personal computers. The language and the syntax are the same. The full-screen text editor is

the same. You only have to learn one software system no matter what hardware your company has installed.

4 **Expandability.** As your needs grow, the SAS System grows with you. We're committed to supporting all the capabilities of our mainframe software system for your PC. Whether you license one product or several, you'll enjoy the same high-quality software, training, documentation, and support we've offered for 10 years. It's all part of our site licensing plan.

Call or write us today.

SAS SAS Institute Inc.
Box 8000 □ SAS Circle
Cary, NC 27511-8000
Phone (919) 467-8000 □ Fax (919) 469-3737

The SAS System runs on the IBM PC XT and AT, IBM 370/30xx/43xx and compatible machines, Digital Equipment Corporation's VAX™ and MicroVAX II™ Data General Corporation's ECLIPSE® MV series, and Prime Computer, Inc.'s 50 series. Not all products are available for all operating systems.

SAS is the registered trademark of SAS Institute Inc. Cary, NC, USA. dBASEII and dBASEIII are registered trademarks of Ashton-Tate. Lotus and 1-2-3 are registered trademarks of Lotus Development Corp. Copyright © 1986 by SAS Institute Inc. Printed in the USA.

SMALL TALK

William Zachmann

Using ports in PC storm

Not every user has too many peripherals for too few serial ports on an IBM Personal Computer or compatible. But for those who do, a handy solution is provided by the Crosspoint AB+.

The product, from Eugene, Ore.-based Crosspoint Systems, Inc., is a software-controllable switch that allows a user to connect up to seven serial peripherals to a single serial port or up to six serial peripherals to two serial ports.

With the Crosspoint AB+, a user can, for example, connect a modem, a plotter, a serial mouse, a direct serial connection and a Lotus Development Corp. Signal board — all to the same personal computer — with little effort. With two serial ports on the system, two devices can be used at the same time.

Best of all, the Crosspoint AB+ easily switches any device onto any serial port with simple commands that can be issued from batch files. Switching to your modem or terminal port when starting up a communica-

PS/2 stalls New York PC plans

Big Apple MIS execs wary of Micro Channel's potential pitfalls

BY ALAN J. ALPER
CW STAFF

NEW YORK — Uncertainty regarding the potential benefits and pitfalls of IBM's Personal System/2 family is causing some MIS managers here to delay their purchase decisions. They said recently they are putting off such decisions until they are sure of the strategic rationale for adopting the new technology.

This was one of many interesting findings of a survey of Manhattan-area MIS executives' purchasing plans conducted by Cald-Assod Computerland Corp.'s White Plains, N.Y., store during a seminar on the PS/2 sponsored by Information Management Perspective, Inc., a New Brunswick, N.J. consulting firm. The 28 respondents to the questionnaire composed a cross-section of the Fortune 1,000 and included firms such as J. C. Penney Co., Bankers Trust Co. and

Metropolitan Life Insurance Co.

Approximately 68% of the MIS executives surveyed said their business units plan to purchase IBM-made microcomputers over the next 12 to 18 months. Five percent said they intend to buy Compaq Computer Corp. micros, while 27% said they anticipate bringing in systems made by NCR Corp., Toshiba Corp. of Tokyo and Corona Data Systems Corp.

OS/2 UPDATE

Multitasking for the masses

BY EDDY GOLDBERG
SPECIAL TO CW

PETER PERRY

The future of IBM's recently announced Personal System/2 and Microsoft Corp.'s MS OS/2 operating system as the next standards for personal computers is pretty much assured, judging from reactions since the unveilings on April 2. But for the next year or two, this graying a blockbuster announcements will have very little effect on the daily life of the corporate PC user. In fact, one might ask, "Who needs these things, anyway?"

The answer, of course, is MIS and micro-computer managers who want to bring multitasking — at long last — to their installed base of Intel Corp. 80286-based, IBM Personal Computer AT-class PCs without re-

Hercules to bulk up IBM's VGA

BY ALAN J. RYAN
CW STAFF

In a release slated for this fall, Hercules Computer Technology, Inc. reportedly will offer a graphics board that the company recently said will enhance the Video Graphics Array (VGA) of IBM's Personal System/2, which is also fully compatible with other Hercules graphics modes, including Ramfont, the firm's popular graphics mode that is geared toward text-oriented applications.

The Hercules PS/2 Card, designed to work with the PS/2 Models 50, 60 and 80, will not interfere with the graphics included on the motherboard of those units, according to Bruce Cummings, Hercules' executive vice-president.

"It will be the only video card that plugs into the PS/2 and brings the PS/2 into compatibility with the PCs that are out there," Cummings said.

The board is said to enhance

Intel smoothes 82786 development path

BY JAMES A. MARTIN
CW STAFF

SANTA CLARA, Calif. — Intel Corp. has announced four enhancements to its 82786 graphics coprocessor that reportedly improve the speed, adaptability and design flexibility for programmers developing applications for the chip.

The 82786 coprocessor features two independent processors on one microchip for the manipulation of graphics and text and for executing multiple hardware windows, Intel said. The new features include a Version Register, which reportedly will

enable the chip to identify itself to software, ensuring that the software is aware of the chip's enhanced capabilities.

In addition, the enhancements are said to minimize the random-access memory requirements and design time for programmers and allow a single-bit monochrome image to be partially overlayed on top of a one-, two-, four- or eight-bit graphics image.

Vendors' input in design

"We developed these features from input from software vendors, who told us that adding these features would make it eas-

ier for them to write their software," said Mark Olson, manager of Intel's graphics product line.

Microsoft Corp.'s Windows, Xerox Corp.'s Ventura Publisher and other graphics-oriented systems running under Windows support the 82786 graphics coprocessor, Olson said. Intel has received commitments from "just about everyone who writes drivers for the chip" to take advantage of the new features in their future software releases, he added.

The 82786, available now, costs $67.50 per unit in quantities of 10,000 and $85 per unit in quantities of 1,000.

Separately, Olson said Intel was currently developing add-in cards to enhance the Video Graphics Array (VGA) technology built in to most of the IBM Personal System/2 series.

"We're glad IBM put VGA on the motherboard, because we no longer have to put an Enhanced Graphics Adapter chip on an enhancement card," Olson said. The VGA chip is compatible with the EGA chip. Graphics boards for IBM's older Personal Computer series required an EGA chip, since it did not exist on the PC motherboards.

Olson said there will be a strong need for graphics resolution beyond the 640-by 480- by 16-pixel resolution offered by VGA but would not elaborate on when Intel plans to release a product.

PC plans

About one-third of those who plan to buy IBM microcomputers said they are unsure whether to purchase current-generation Personal Computers or forge ahead with the PS/2.

MIS executives are still weighing the advantages of the Micro Channel bus architecture — including potential expansion capabilities, the ease of use of IBM's OS/2 operating system and issues involving the retraining of end users, according to a sampling of responses from the audience.

'A strategic decision'

"Purchasing the PS/2 is a strategic decision," noted Matt Fitzsimmons, proprietor of the White Plains Computerland. "In the past, most PC equipment was extremely forgiving. If you had a problem, you could always add more memory or another disk drive.

"With the PS/2, you have to think things out more carefully," he continued. "Eventually, third parties will come up with new solutions. But as it stands now, if you make the wrong decision, it will be hard to live with."

Twenty-five percent of those surveyed said they intend to buy the PS/2 Model 60. The Model 50 was called the second most desirable unit; 23% of the respondents said they anticipate buying one or more.

Not surprisingly, the Model 30, which many observers have dubbed "the orphan," was said to be in the purchase plans of only 1% of the audience. The Model 80 is the machine of choice of 8% of the respondents. Fourteen percent of those surveyed said they intend to purchase PC ATs, while only 1% said they will buy PCs or XTs.

Of the 5% who said they plan to buy Compaq micros, only 17% said they intend to purchase the Deskpro 386. Almost two-thirds of Compaq customers said they expect to buy additional portables.

Regarding networking plans, 18 of the firms in attendance said they have a solid strategy. Six firms said they anticipate using IBM's Token-Ring, while three said they are leaning toward networks from Novell, Inc. Eight firms reported that they have not yet decided which local-area network (LAN) hardware adapter to use. Nine firms said they plan to use Novell Netware software, while two said they expect to go with IBM's LAN software, and seven remain undecided.

SHARING— ISN'T KIDS STUFF!

**In an MVS or MVS/XA multiple CPU environment, Duquesne Systems'
shared device software products provide single system
data protection and operation efficiency.**

Sharing devices among CPUs or system images is efficient. But sharing is risky business unless you have the proper software safeguards. Major problems like host dataset integrity and reserve lockout are inevitable, difficult to detect, and expensive to fix.

Now you can correct these unnecessary, costly problems and gain more than protection, without expensive additions to hardware or exposure to hardware failures.

Duquesne Systems has a complete line of software products designed to help in three resource sharing problem areas. With these products, you can ensure data integrity and eliminate RESERVE performance problems in shared DASD environments, manage allocation of tape drives and eliminate tape overwrites and job reruns, and consolidate messages from multiple CPUs and route them to designated consoles so you could monitor and controlled as if it were a single CPU.

A **FREE** 30-day trial is available for all of our products. Call today and let us share our knowledge with you.

Because sharing doesn't have to be one of life's painful lessons.

**DUQUESNE
SYSTEMS**
Two Allegheny Center
Pittsburgh, PA 15212
(800) 323-2600
(412) 323-2600 In PA

Vericomp rescues PS/2 users, provides EMS

By DOUGLAS BARNEY
CW STAFF

SCOTTS VALLEY, Calif. — Early users of the IBM Personal System/2 family have been forced to sacrifice the ability to use the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) mode of many popular software packages.

But Limbo, a product from Vericomp that was announced last week, allows PS/2 access to the EMS capabilities of packages such as Lotus Development Corp.'s 1-2-3 and enables the use of memory beyond 640K bytes, according to the vendor. The $49 product is available im-

mediately, the company said.

Limbo is said to incorporate EMS driver technology licensed from Borland International. San Diego-based Vericomp is the first OEM for the Borland technology.

The Vericomp product runs on the PS/2 Models 50 and 60 and takes advantage of IBM's Memory Expansion Option Board, a non-EMS board based on Intel Corp.'s 80286 chip.

"Limbo turns it [the Memory Expansion Option Board] into an EMS board," said Bill Gordon, president of Vericomp.

According to Spencer Leyton, vice-president of business development at Borland, EMS technology provides a way

for users to address extra memory without waiting for OS/2, the next-generation operating system jointly developed by IBM and Microsoft Corp.

Although Borland will not sell its EMS driver as a retail product, the company will make it available to interested corporations on a negotiated basis, Leyton said.

"A lot of people are buying PS/2s which have EMS software, and [they] want to accommodate those large 1-2-3 spreadsheets," Leyton said. "It is an opportunity for corporations to justify the purchase of new hardware technology and have a bridge to new operating systems."

PC storm

tions program is an easily done as switching to a plotter when starting your graphics program.

Even initial setup is quite straightforward. In fact, it is a lot easier than it appears from a first read of the Crosspoint AB+ manual. The documentation provides a work sheet to write down exactly what you are going to connect and what its characteristics are. (I never bothered with all that.) Once you get the idea of the thing, it is remarkably easy to set up, and adding or removing devices from the system is just as easy.

The setup

Basically, you attach the supplied adapters to the 25-pin RS-232 connectors on the system's serial ports and on the peripherals you are going to use. Eight of these are supplied with the Crosspoint AB+. The two female adapters are used for the serial ports, and the remaining six male adapters go on the devices.

The adapters have RJ12 telephone-style modular sockets on them. Through these, you simply connect the serial ports and the peripherals to the Crosspoint AB+ using telephone-style modular cables, which are also included with the unit. There is no need for the bulky, shielded RS-232 cables normally used for serial peripheral connections.

The only other step in the physical setup is to run your parallel printer cable to the Crosspoint AB+. A ribbon cable runs from the AB+ to the printer, or parallel, port on the personal computer. This can be a little confusing, even though it is easy to do.

Since the AB+ simply switches devices on the serial port and does not switch the parallel printer port, it isn't very clear why the parallel printer gets into the act at all. In fact, when I first looked at the AB+ switch, it wasn't even clear to me whether it served as a serial port switch or parallel port switch or both. It took a little head-scratching to get it straight. In reality, however, it is not at all complicated.

The Crosspoint AB+ uses the parallel port as a means of controlling the switch. Passing the parallel printer line through the AB+ does not affect the normal operation of the printer in any way. The function of the AB+ is simply to switch devices on and off the serial port. Of course, printers with a serial interface can be attached through the AB+.

Software setup is also quite easy. A single program, ABPLUS.COM, is used both for initial setup and ongoing operation. A Switch Setup window is used to specify what is plugged into the eight RJ12 sockets on the AB+. Devices may be specified in terms of a specific bit/sec rate, parity and number of data and start bits. Alternatively, as in the case of variable-speed modems, devices may be defined as "adaptive," for which detail parameters are not specified. An Application Setup window is then used to assign application names to particular connections made through the switch.

Priced at $399.95, including the switch itself, adapters, cables, software, power supply and documentation, the AB+ is a tremendously useful device.

Zachmann is vice-president of research at International Data Corp.

Executive confesses to computer collaboration using In-Synch!

John Merson, noted microcomputer industry executive, has confessed to using IN-SYNCH for the purpose of computer collaboration. This is the first public statement in what appears to be the rapid proliferation of IN-SYNCH-based no-computing throughout industry and government.

Collaborating the Easy Way

In an exclusive interview, Merson recounted his actions, from his first co-computing session to his full-blown use of IN-SYNCH. "It started innocently enough," Merson said. "My partner, who was working in our branch office, needed help drafting a proposal for a prospective new client. With IN-SYNCH, we were able to work together, in real-time, on a WordPerfect document as well as a 1-2-3 spreadsheet. We even developed an AutoCAD drawing and there in some ChartMaster graphs to spice up the proposal. IN-SYNCH made co-computing easy and quick—just as if we were sitting side-by-side. No big deal. No overnight mail. No special networking, just our modems and the regular phone lines."

Collaborators Get Carried Away

According to Merson, the computer collaboration didn't stop there. "I guess I got carried away," admitted Merson, "but it was amazing what we could do with IN-SYNCH." Apparently, Merson and his partner next used IN-SYNCH to prepare a slide presentation, using screens selected from the proposal they had developed. These sequenced "slides," including text, drawings, graphs and spreadsheet data, were then shown PC-to-PC (again using IN-SYNCH) to their prospective client. "The prospect had IN-SYNCH on his PC too," continued Merson, "so we dialed him up and delivered our sales pitch online. He loved it! Said it was just the kind of state-of-the-art stuff he needs in today's fast-paced business world. We beat out the competition and got the job."

Collaborating and Proud of It

Merson showed little remorse. "You'd do the same thing if you saw IN-SYNCH. This co-computing is going to catch on like crazy. The possibilities are too hot to ignore. You can co-run all the popular PC software packages. You can transmit and annotate "snapshots" of screen displays. Develop, save and present "slide shows." And IN-SYNCH keeps "minutes" so you've got a complete audit trail of everything you've done. Managers, engineers, programmers, sales people—they're all going to be co-computing with IN-SYNCH. I just did it first. And I'll certainly do it again. And again!"

Poll Shows Collaboration Spreading

Results of an unofficial poll taken by this reporter show Merson's prediction to be proving true. An inside source at MCI stated, "We use IN-SYNCH all the time to analyze important revenue data. It eliminates the need to express diskettes between headquarters and remote branches." And according to a highly-placed source at Rockwell International, "We're using IN-SYNCH for software development as well as for the training of new PC program users." In perhaps the most stunning admission, the president of Engineering Computer Services, Inc. said, "We're using IN-SYNCH with AutoCAD to help

designers and clients review architectural drawings, thereby expediting schedules and cutting costs."

Cheers for Collaborators

According to a spokesman for AVTC, producer of IN-SYNCH, the company will not press charges against Merson. "We knew when we released IN-SYNCH that it was the first and only product to bring telecomferencing to the desktop of every PC user. With an innovative product, you've got to expect innovative uses. Of the record, well, frankly we're delighted and we'd just like to say: keep on collaborating!"

For more information or the name of your nearest IN-SYNCH dealer. Call 1-800-541-4461 ext. 80 In New York State, 516-430-8000 ext. 86

AVTC

American Video Teleconferencing Corp.
110 Bi-County Boulevard
Farmingdale, New York 11735

Multitasking

sorting to Unix or Microsoft Xenix-based alternatives already on the market. And later, when the software and applications arrive to harness the power of Intel 80386-based PCs, there will also be the productivity and cost benefits to be gained by bringing multiuser capabilities down to the PC level.

The critical question for MIS and macrocomputer managers concerns how to get from here to there with a minimum of pain. They need to protect their installed base — an estimated 875 billion invested in the current Intel chip/MS-DOS standard in approximately eight million to 10 million PCs and 15,000 to 20,000 Microsoft MS-DOS-based PC software applications — without sacrificing the transi-ing and experience of their end users.

Further complicating the picture, Microsoft — which not only has the upper hand but also seems to be gaining a choke-hold on the PC software market — jointly announced with AT&T in February that it also will offer another standard operating system for the 386: the official AT&T-approved version of Unix for 386 machines, scheduled to be available in early 1988. Maybe.

As things stand today, if corporate computer managers want multitasking for their PC users, they have five basic choices:

• Play it safe and wait for MS OS/2 and applications to appear

• Cautiously buy the new PS/2 systems from IBM as they arrive and be a willing pioneer by switching early to MS OS/2.

• Use existing networks or install new ones to link personal computers.

• Use a Unix or Xenix platform to run current DOS applications as tasks running under the non-IBM operating system.

The preceding solutions are relatively inexpensive and exist today for 286 and 386 machines.

• Buy IBM's announced 3270 Workstation Program, which is scheduled for a summer release. It promises multitasking with mainframe access by emulating IBM 3270 terminals through the company's Token-Ring network without an IBM 3278 or 3279 adapter. It will work on existing PCs and most of the PS/2 series.

However, MIS and PC managers need to ask several fundamental questions before embarking on the uncertain and complicated road to multitasking. Are the implied gains worth the growing pains? Yes, if you think about the advantages that multitasking can bring to the right work environments.

Are end users really knocking down MIS's door asking for multitasking? On the whole, no. The reason: The average corporate

user is not familiar with the advantages of multitasking and, therefore, doesn't know to ask for it.

What the market offers

Beyond IBM and Microsoft, the current spate of microcomputing activity being reported in the press is generated primarily by software developers and PC clone makers. They are scrambling to chart a new course on the still-undefined PC path, which were thrown into turmoil

by the IBM-Microsoft tidal wave. In their haste to formulate public positions, these vendors are creating many secondary waves of their own as they struggle to survive and stake their claim on future market share.

From the corporate PC buyer's point of view, the only clear outcome from the recent flood of information is confusion, with its usual marketplace result: watching and waiting. Without a doubt, it's all very interesting for MIS and micro managers to keep score as the contending vendors engage in their own brand of Wrestlemania, but corporate buyers are waiting to see who's left in the ring when the bodies stop flying.

At the Massachusetts Mutual Life Insurance Co. in Springfield, an attitude of active neutrality prevails. "We're just stepping back and waiting a little while for some of these things to get a little bit clearer," says Executive Vice-President John Pajak. "That has to be the strategic direction we take at this point. I wouldn't say that we're in a holding [position], in the sense that we're standing by and doing nothing; we're in an evaluation and assessing position right now."

George DiNardo, executive vice-president and chief of the Information Management and

Research Department at Mellon Bank NA in Pittsburgh, sums up buyer frustration. "Are you going to make a major commitment to anything, including IBM, when you have all this competition going on? No. I guess that's why I say that I don't think that a box that does what he needs. Why would I buy another? I'm just going to let the projects fly from one enemy camp to the other one and watch them go back and forth," he says.

It appears, then, that the new IBM and Microsoft products are bound to be important, but not yet — at least in terms of corporate buying activity. In fact, there really isn't much to buy right now. According to Microsoft's delivery schedule, it will be quite a while before applications utilizing the new capabilities of MS OS/2 are in the hands of the end user. The following is Microsoft's most recent delivery schedule:

May 1987: The MS OS/2 Software Development Kit shipped to software developers with a beta-test release version of the MS OS/2 system kernel, development languages and tools, plus specifications for the Presentation Manager and MS OS/2 LAN Manager.

August 1987: The MS OS/2 Presentation Manager ships to developers as an update to the development kit.

December 1987: The MS OS/2 kernel ships to OEMs; phased release begins. Meeting this target date depends on developers' feedback after the release of the kit. If history is a teacher, this date will slip.

Fourth-quarter 1987: The MS OS/2 LAN Manager is released to developers — as updates to the MS OS/2 Software Development Kit — and OEMs. Another piece to integrate.

First-quarter 1988: The MS OS/2 kernel is shipped to end users. This, as Microsoft product literature attests, is only anticipated.

Date uncertain: The delivery date for the extended version of OS/2 will not even be announced until the fourth quarter of this year. That is six to eight months before the folks at Microsoft and IBM are even willing to predict a delivery date.

So what is the bottom line? It will be mid-1988 or beyond before applications utilizing the multitasking capabilities of MS OS/2 appear in users' hands. More complex applications, incorporating the Presentation Manager and LAN Manager, could be as far away as early 1989.

Early buyers of IBM's PC AT's now considering the PS/2 line would do well to recall the implied promises for a multitasking MS-DOS when the first AT's were unveiled. Remember MS-DOS 5.0, also known as Advanced DOS? Those early buyers

are still waiting. So why should they buy PS/2 systems now? Granted, the 286-based AT-class machines offer users greater speed, but are the price/performance gains of the PS/2 series worth the risk of early purchase?

At The Travelers Corp. in Hartford, Conn., Senior Vice-President Joseph Brophy looks out onto a sea of 20,000 PC users. He says he, too, is frustrated with how long it will take for MS OS/2 to arrive in a useful form but that he looks forward to its eventual arrival.

"We wish it were here today, because we could apply it, but we have to wait. We think it has a lot of promise for multitasking," Brophy says.

Brophy, who cites many personal uses for multitasking, says he is "glad they made the announcement, and the sooner we get it, the better."

Nevertheless, what to do with the millions of PCs already in use is a thorny issue. Brophy acknowledges, "In terms of upgrading and protecting investments, that's a difficult question. It depends on where people are.

People on the IBM PC XT and basic PC have a problem, because there is some incompatibility there. If you're on the AT — and we've been buying the AT's in the last year or so — you do have some upward compatibility," he says.

At Mellon Bank, DiNardo put in his company's first order in early May — for on PS/2 box.

He says he ordered it "just to have something to play [with] and see what it does and see what the implications on the current and the new operating system are."

Nevertheless, DiNardo acknowledges future importance of PS/2 and OS/2 and says that what is important to him now is to get ready for their arrival. "Listen, it enhances all of our capabilities, and when it happens, we'll do it," he says.

In order to give his 700 PC users a chance to trade in their old computers for the new IBM systems, following IBM's April announcement, DiNardo opened up a used computer store at the bank. Contrary to his expectations, the response was underwhelming. "Everybody could have sent down their old boxes," he explains. "And I figured, 'Oh boy, there's gonna be a mad crescendo of movement to the new boxes,' right? In one month, I have not gotten one application for a turn-in. I did not get one box turned in. That's out of 700."

His explanation is that the current generation of PCs and applications already does the jobs his users require. "People are getting disinterested," he says. He also mentions the complications of going beyond the single-user box, including networking, mainframe access and how other PC users can access each other's data bases.

Another difficult choice for MIS and micro managers is deciding which applications should run under the current versions of MS-DOS and which should be rewritten to take advantage of the greater capabilities of MS OS/2. According to Microsoft, "MS OS/2 can run most existing applications designed for MS-DOS." Which applications will not run, and in what ways, is still an open question.
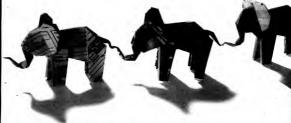
"There's really a whole new architecture evolving in how you use computing in a knowledge work environment," The Travelers' Brophy says.

"The old time-sharing, where the host controls everything, is finally going to give way to an environment where the personal computer on your desk — or mainframe on your desk — really is the controlling node that controls all the resources. But you've got to understand that. We're struggling to understand how to do it. You evolve into it," Brophy says.

The surprising advantages of size in business communications.

Integrating voice and data for economies of scale. AT&T Comes Through.

It supports 500 lines. It supports *32,000* lines. It supports an A-to-Z of voice and data applications. And the more lines, the more devices you plug in – the more efficient it becomes.

"It" is an AT&T System 85. The company flagship. *AT&T's Big Switch.* The AT&T System 85 integrates *all* of a company's voice and data communications into a single network of networks, opening the door to huge economies of scale.

Saved. Much of the money now spent on single-purpose networks.

Saved. The expense of installing a switch at every

business location. With remote modules, one System 85 can serve a 19-square-mile ring of up to 30 offices.

Reduced. The "people" costs you now budget for network management and message handling. System 85 can centralize and simplify these and other administrative tasks.

For a detailed evaluation of what your company stands to save—and to gain—from an AT&T System 85, please contact your AT&T Account Executive. Or call 1 800 247-1212 for the AT&T office nearest you.

From equipment to networking, from computers to communications, AT&T is the right choice.

AT&T
The right choice.

Tool brings CPU strengths to batch language

BY JAMES A. MARTIN
CW STAFF

DANBURY, Conn. — VM Personal Computing, recently announced an IBM Personal Computer software development tool package that reportedly brings mainframe capabilities such as script language, editor and screen manager into an integrated IBM PC- and Microsoft Corp. MS-DOS batch language environment.

The package, Beyond Bat, is based on the vendor's script language, which VM Personal Computing said also serves as the cornerstone of the company's Relay communications software packages. "We found some Relay customers were using its script language to automate procedures not related to communications," President Robert Millstein said. "That gave us the idea to make a product using the same script language that would take up less memory, would cost less and be better integrated with the operating system."

Beyond Bat is said to allow developers to create or combine existing applications using features not available in the DOS batch language. "The product offers developers a group of tools they were used to in the mainframe world, such as a panel manager, editor and script language — things that haven't been convenient or integrated before on the microcomputer level," Millstein said. Possible applications also include designing data entry systems.

The product retails for $99 and is available now.

Hercules
FROM PAGE 29

Lotus Development Corp.'s 1-2-3 Release 2 and Symphony Version 1.1 as well as Microsoft Corp.'s Word using software drivers developed by Hercules.

In a recent interview, Cummings outlined three opportunities for graphics for the PS/2 family. One, he said, is developing an Enhanced Graphics Adapter (EGA) card with 640-by 480-pixel resolution for "personal computer classics." He said this "me-too" ..-pproach works by activating the 640-by 480-pixel mode already present on existing EGA chips.

Cummings predicted that "me-too" graphics cards will be designed by many board makers, including Hercules. "We'll have a board, and so will every other company. That's called assigning a junior engineer to an exercise," he said.

The second opportunity, Cummings said, is creating a card that will emulate the PS/2's VGA for "PC classics," which involves plugging a card into a personal computer to bring it into compatibility with the PS/2. To do this, he said, the manufacturer would have to clone the full range of graphics and text capabilities on the PS/2 motherboard. Emulation would be questionable, he claimed, and with a $595 version already announced by IBM, there is not much need for this product.

Cummings said his company is not pursuing option No. 2 yet. "Emulating the PS/2's VGA for PC classics is a bad idea for us," he said. "We can't do anything better in that area — at least not yet — so we say, 'Buy IBM.'"

The third option Cummings outlined is the VGA enhancement and compatibility with existing "PC classic" standards, the Hercules PS/2. The card, he said, would improve spreadsheets and word processors and would offer higher resolution graphics for more software.

"Our first inclination after the introduction of the PS/2 was, 'Stay with what's out there — IBM Personal Computer ATs, XTs and clones.' However, some of our corporate customers are going for the PS/2s and have asked us if we will make a card for them. We're moving it up on our production schedule," Cummings said.

AND NOW, AN UNFAIR
COMPARISON BETWEEN THE COMPAQ 386
AND THE NEW PC'S LIMITED 386.

Not terribly fast.
Not terribly cheap.

PC'S LIMITED 386®

NEW PRODUCTS

Systems

Sapphire, a system said to allow IBM Personal Computers and compatibles to capture and store ASCII streamed data while operating under emulation as an IBM System/34, 36 or 38 workstation, has been announced by **Dynamic Communication, Inc.**

According to the vendor, the Sapphire workstation receives, archives and transfers incoming ASCII file records to EBCDIC host file. Incoming data may be passed to the PC's asynchronous communications port via an external modem or an RS-232C cable.

Sapphire is said to enable the user to perform certain IBM PC-DOS-based functions. Included are emulation, emulation card, asynchronous communications board and serial clock and emulator transfer utility. Sapphire costs from $2,000. Remote polling-site versions begin at $995.

Dynamic Communication, Suite 700, 711 Leyden St., Denver, Colo. 80220.

Software applications packages

A financial analysis software product that combines spreadsheet, modeling and data base functions has been introduced by **Javelin Software Corp.**

Javelin Plus performs budgeting, forecasting, consolidating and reporting functions as well as data handling functions. Users can enter text or dates anywhere they can enter a number. Dates can be used in formulas as well, the vendor said. Data base functions allow the user to select or sort records in a list as part of a model. The software is also said to offer cross-tabulation functions.

Javelin Plus is priced at $249.95.

Javelin Software, Building 200, One Kendall Sq., Cambridge, Mass. 02139.

Software utilities

Software said to add to Lotus Development Corp.'s 1-2-3 and Symphony work sheets, allowing users to find optimal values for defined variables, has been introduced by **Enfin Software Corp.**

Optimal Solutions is the second module of Enfin's Decision Support Solution series. Features include a full-screen form window for problem setup and viewing of results; a built-in display and "what-if" shell for scenario building; display and calculation of shadow prices, reduced costs and slack values in a form window; allowance for variables to be real numbers or of type zero/one; a vector product key to minimize entry of long formulas; the ability to call Optimal Solutions from Lotus macros; an indexed Help screen; and a Lotus-style user interface.

Optimal Solutions costs $99.95.

Enfin, Suite 106-A, 6920 Miramar Road, San Diego, Calif. 92121.

Printers/Plotters/Peripherals

The PC Publisher Kit, software said to provide users of Hewlett-Packard Co.'s LaserJet and compatible printers with desktop publishing features, has been announced by **Imagen Corp.**

The PC Publisher Kit is based on Ima-

gen's document description language. It uses raster-image processor technology and provides such features as full-page graphics and font scaling capabilities. It works with IBM Personal Computer XTs, ATs and compatibles and comes with a base set of 18 typefaces.

The PC Publisher Kit is priced at $1,895.

Imagen, P.O. Box 58101, 2650 San Tomas Expwy., Santa Clara, Calif. 95052.

Board-level devices

Univision Technologies, Inc. has announced the UDC-800 series image display controller.

The 2,048- by 1,536-pixel by 8-bit controller is a single IBM Personal Computer AT-compatible card. The UDC-800 series is said to support 60Hz noninterlaced monitors. It features 3M bytes of dual-ported memory, up to 512K bytes of display-list memory and video random-access memory.

Basic commands include line, polygon, arc, circle, fast-bit block copies and text. It comes with initialization and diagnostic software and supports Microsoft Corp. Windows.

The UDC-800 image display controller costs $6,995.

Univision Technologies, 12 Cambridge St., Burlington, Mass. 01803.

announced the UDC-800 series image display controller.

Interaction Systems, Inc. has announced the **Model 4003 Touch** Controller board for IBM Personal Computers.

The plug-in touch controller board is said to add capacitive touch-input capability to the PC. The user is able to input and access data via touch when the 4003 board is inserted into an IBM bus slot, a standard Interaction Systems touch screen is attached to the monitor and the touch screen is connected to the controller via a single cable. The Model 4003 features standard spatial resolution of 256 by 256 pixels, skew compensation and write default.

The Model 4003 is priced from $295.

Interaction Systems, 130 Lincoln St., Brighton, Mass. 02135.
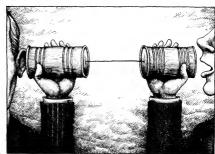
There are still a few communications systems we can't connect to IBM/DISOSS.

Luckily, precious few. Thanks to ITT Worldbridge.℠

ITT Worldbridge is an integrated electronic messaging service that can connect your IBM DISOSS users to incompatible systems worldwide.

Whether these systems are corporate information systems, office automation systems, private message networks, public and private electronic mail systems, or the public telex network.

Best of all, ITT Worldbridge OfficeAccess℠ service can do this using the IBM DISOSS subsystem you already have in place. It

Worldbridge

requires no additional programming. No special equipment.

And because many messages are switched directly from one system to another, without passing through the telex network, they can be sent and delivered at much higher speeds and without any rekeying.

Equally important, at significantly lower cost.

In short, Worldbridge can increase your company's communications capabilities almost

beyond measure.

But that should come as no surprise. Because from 50 baud telex, to 2.048 megabit satellite transmission, to digital packet switching, ITT Worldcom offers a spectrum of communications services to meet the needs of any company.

To find out more about Worldbridge, or arrange to get a free demonstration, call

us at 1-800-922-0184.

Or write: Director, ITT Worldbridge Marketing, 100 Plaza Drive, Secaucus, NJ 07096.

We may not be able to connect you to every communications system in the world.

Just every one that's _worth_ the connection.

COMMUNICATIONS SERVICES VIA **ITT**

3Com fills out software plans

Users will get windowing, corporatewide links; product blitz set for '88

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — A recently released paper detailing 3Com Corp.'s software direction for the next three years and beyond focuses heavily on plans to tie 3Com users into corporatewide systems.

Users can expect to see 3Com expand its current work group-oriented product offerings to include connectivity to IBM's System Network Architecture, Digital Equipment Corp.'s Decnet, Unix and the Transmission Control Protocol/Internet Protocol, as well as advanced network management and the ability to run multiple protocols on 3Com's intelligent

adapters, according to the paper. Some of these products are slated to be announced as part of a 10-product blitz planned for next year.

In 1988, 3Com said it plans to tackle a number of areas by integrating Microsoft Corp.'s OS/2 LAN Manager into 3Com's 3+ network operating system. The merged product reportedly will be called 3+ Open.

3+ Open will continue to support both protected-mode IBM Netbios support and IEEE 802.2 to protect existing applications development and making 3+ networks, 3Com said.

3+ Open will allow the server and station sides with minicomputer-like functions, such as interprocess communi-

cations, multitasking, distributed computing and event auditing.

Other projects slated for 1988, according to 3Com, include the following:

● 3+ Windows. A fully graphics-featured window interface will eliminate the need for users to know command-line directions.

● Network management. 3Com will focus on monitoring, controlling and administering the network using graphics displays, test tools, advanced messaging and other tools.

● Mainframe access. 3Com will use applications built on the Data Link Control/Logical Link Control interfaces provided with 3+ and will offer gateways,

Continued on page 48

Pronet-10 beefed up, price cut

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — Proteon, Inc. last week enhanced its Pronet-10 10M bit/sec. token-ring network with network management software and an IBM Micro Channel interface and also announced some price cuts.

The Tokenview-10 advanced network management software features performance analysis, configuration management and network troubleshooting from a single, centrally located station. Proteon offers the same management services for its Pronet-4, a 4M bit/sec. token-ring network.

Proteon said it will introduce network management software at reduced prices, with a not offered on the Micro Channel interface, in three phases.

Phase 1, set to be available in September, will reportedly include network configuration, data collection and statistical analysis functions to assist network administrators in isolating potential problems on the network. Phase 2, to be available in December and upgradable from Phase 1, is said to add automated fault-identification and isolation.

With the introduction of Phase 3 in the first quarter of 1988, Tokenview-10 will handle

Continued on page 48

Data View

Network management
Companies planning to buy network management and performance measurement by industry

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: MITCHELL J. HAYES

Prudential takes to sky

Satellite network replaces leased lines

BY DAVID BRIGHT
CW STAFF

NEW YORK — Prudential-Bache Securities, Inc. hopes to obtain faster, cheaper and more reliable data communications by converting from a terrestrial leased-line network to a satellite-based system, company officials recently said.

Tridom Corp. in Atlanta will implement a network of its own Clearlink very small-aperture terminals (VSAT) — small satellite dishes that operate over the Ku-band frequency. The Clearlink nodes, which are slated to be installed at more than 300

Continued on page 48

Digital
has
it
now.

For Hardee's™, the nation's third most popular hamburger chain with over 2700 restaurants, instant access to information has become an essential ingredient in their success. "We give our managers the power of centralized computing in their own decentralized environments," points out Bill Burd, vice president of Management Information Services. "With Digital's innovative approach to networking information, our managers get a better handle on day-to-day operations. And they're delighted because they spend less time on paperwork, more on personal services."

Besides improvements at the local level, Mr. Burd sees the benefits of Digital's

"The consistent quality of Digital's information network is serving the Hardee's organization at every level."

communications resources throughout the entire Hardee's organization. "Our ability to share timely, accurate information produces results not just at the counter where the food is served, but at the district manager level and at corporate headquarters. Tighter control over company operations gives us an edge in our highly competitive market. We are able to deliver a higher quality product with greater efficiency."

To get your competitive advantage now, write to: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742. Or call your local sales office.

digital™

Baby Bells

controlling stock in a company that is developing fiber-optic links across the Atlantic Ocean, then applied to Greene for a waiver so that it could start to offer a link between the U.S. and Europe. MCI quite correctly pointed out that Nynex would

have a built-in advantage in this market, since it controls local-loop traffic in New York — home to many international firms and a termination point for a lot of transatlantic cable.

These valid concerns justify the caution with which both the Federal Communications Commission and Greene are viewing the holding companies' proposals calling for new tariffs and

business investment.

However, there is a risk that certain parties are exaggerating the danger posed by the deregulation of the Bells simply as a way to stifle potential new competition on their turf.

For instance, AT&T claims that letting the Bell operating companies into the interexchange business will cancel out all of the gains wrought by di-

vestiture — meaning, I presume, that one or more of the operating companies could duplicate prodivested AT&T's near-monopoly in both long-distance and local telephone services.

Think about it. AT&T — which has been clobbering MCI and U.S. Sprint Communications Co. — is depicting the Bell operating companies, which would have to acquire or build

their long-distance lines from scratch, as the potential new Godzillas of the long-distance market.

Perhaps the most far-fetched case against the operating companies that I have heard to date is from a representative of a Fortune 500 financial company, who claimed that if Greene allows the regional holding companies to enter the information services market, they'll have a field day in the financial and insurance industries — for two reasons. One, they could sell communications to their customers at cost; and two, they would have "proprietary access" to the telephone companies' data bases, which they could then use for demographic studies.

I find it hard to picture emancipated holding companies running roughshod over the likes of Chemical Bank or Citicorp. They would have to build the expertise and the staffs from ground zero, and the FCC and Greene have been on the watch against cross-subsidization and unfair pricing ever since divestiture.
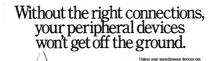
A lesson learned

Nor does past history support the premise that the operating companies will run amok in new markets. During the first year or two after divestiture, several companies showed a disconcerting tendency to purchase computer stores and software firms and to market themselves as "full-service systems integrators." But they learned the same lesson AT&T learned from trying to sell computers — running a regulated monopoly does not necessarily prepare you for competing in an unregulated, cutthroat market in which you have to buy most of your expertise.

Perhaps their past experiences have made the holding companies more cagey. Right now, while they lobby Greene to lift his restrictions on information services, many of them are busy trimming organizational fat and performing user surveys to determine market demand for various types of basic and enhanced services.

This seems like a far better strategy right now than peppering the FCC with new tariffs. As one consultant pointed out recently, the regional holding companies need to identify markets that will make use of their peculiar combination of resources and expertise. Right now, they are still too communications-oriented, trying to sell plain vanilla transport when they should be selling applications. Until they do, they won't be electrifying many new markets; and consumers, if not competitors, may be the poorer for their absence.

Watch what happens next time you ask a mainframe software vendor for a complete customer list.

Prudential

Prudential-Bache branch offices in the U.S. will communicate with a Ku-band hub station from GTE Spacenet Corp. in McLean, Va. GTE Spacenet says it will supply the transponder bandwidth on its Gstar satellite. The company is also providing network monitoring and management services and field maintenance of on-premises equipment.

Currently, Prudential-Bache has at least 20 branch offices are using the satellite network on a full-time basis, with the remaining branches scheduled to be added by December. The network is expected to reduce the firm's data communica-

tions costs by as much as 40%, cut response times by 20% or more, reduce downtime by at least half and more than double capacity.

Reliability became a key issue for Prudential-Bache when branch offices began relying solely on computer-based communications with the central office, according to William T. Rush Jr., vice-president of telecommunications. "The network executive no longer has the paper backup be used to have. All of a sudden, the reliability that was great a couple of years ago is no longer acceptable."

Rush says the sheer complexity of the company's terrestrial system, which involves more than 100 multidrop lines, allows too much room for human error. "For every central office these lines go

through, you have human beings [responsible for maintaining lines]. Human beings have a potential for making mistakes," he adds.

Previously, an average of 2% of the terrestrial network was down at any one time, Rush says. But he projects that the satellite network will be down "significantly less than 1%" of the time when fully implemented.

Another major benefit of the satellite implementation is the ability to quickly reconfigure the network for new applications. According to Rush, even fine-tuning a terrestrial network can be a "horrendous" experience, while many changes on a satellite network can be accomplished overnight via software alterations. He notes that Prudential-Bache

once spent a year changing the way the branches were being fed data.

The use of Tridom's 1.8-meter dish, which is larger than many VSAT terminals, should minimize weather-related problems that sometimes plague satellite networks, Rush claims. "Also, if the signal drops out, our autodial backup facility automatically steps in."

Another potential trouble spot is the possibility of security breaches, especially since Prudential-Bache will be sharing a GTE Spacenet hub with other firms. But Rush says the network includes security levels such as complex polynomial algorithms and traditional passwords, making it "very, very difficult to crack."

Prudential-Bache had originally intended just to add reliability, ease of deployment and other improvements to its existing terrestrial networking system, but "the key [terrestrial network] vendors said, 'You can't do much more than what you have right now,' so we cast our net a little wider," Rush explains.

Small change for the better

3Com plans

CCITT X.25 routing, CCITT X.400 access and Integrated Services Digital Network interfaces. 3Com said it expects to support the full Open Systems Interconnect model at the multivendor Enterprise Event scheduled for June 1988, allowing direct access to minicomputer systems.

3Com said it will focus more strongly on Unix in 1988. "Unix stations are likely to be the newest workstation of choice for business desktops, and 3+ will allow for the integration of these high-powered devices," 3Com said. Specifically, FTAM and NFS server protocols will be added to Microsoft's Server Message Block server protocols, allowing users to select the appropriate protocol.

Also slated for 1989 are limited use of artificial intelligence and network-entrinsic applications such as scheduling, tracking and calendaring as part of 3Com's basic system offerings. In addition, multimedia integration will be provided for all workstations through voice store-and-forward, voice-annotated text, high-resolution graphics and facsimile capabilities, 3Com said.

Pronet-10

all network performance, configuration management and troubleshooting activities automatically, Proteon said. Phase 3 is said to enable Network administrators to perform problem determination and error recovery via the network management system to minimize network downtime. Pricing is not yet available.

Proteon also announced a high-speed interface card for IBM's Micro Channel architecture that it said will provide a direct connection to IBM's Personal System/2 Models 50, 60 and 80. Proteon and the PS/2 Model 30 is already supported by the Pronet-10 P1303 interface for IBM Personal Computer AT's. The new card should be available in November.

Proteon also announced it has reduced the cost of its P1300 IBM PC and P1303 IBM PC AT Pronet-10 interface cards by more than 30%. The P1300 card now costs $545, and the P1303 costs $595.

SPOTLIGHT

▼ACCOUNTING AND FINANCIAL SYSTEMS

Seeing how all the pieces of the puzzle fit together becomes more achievable when there are tools available that permit some perspective. Accounting and financial software packages are just now beginning to provide organizations with that long view.

How to avoid the
consequences of a mis-match.

You need accounting software that doesn't fight you.

You've been successful by doing business *your* own special way. So you need an accounting system – the very heart of your operation – that will follow the path you dictate, and not the other way around.

You need Pinstripe™ – the complete accounting package.

Its modular construction lets you build from the basic ledgers; A/P, A/R, Fixed Assets, etc., all the way through General Ledger.

But most important, Lawson will make sure that Pinstripe does exactly what you want it to do, the way you want to do it. Need a special calculation in Cost Allocations? An interface to your billing system? Need help in meeting a tight installation schedule?… you got it.

In fact, Lawson does whatever it takes to

give you the accounting system that matches your special way of doing business.

For more information on how you can avoid a mis-match, call Lawson today. At the same time, ask about our Distribution and Human Resources systems too.

LAWSON ASSOCIATES INC.
2021 East Hennepin Ave., Minneapolis MN 55413
1-800-672-0200

IBM and Unisys mainframes, IBM S/38.

LAWSON

…WHATEVER IT TAKES!

INSIDE

Peeking at the Future

Financial modeling programs help users grasp the present and touch the future. Page S2.

Simulation and Reality

Modeling software demonstrates its everyday utility at a Canadian conglomerate. Page S4.

Advise and Vend

Large accounting firms are finding software sales and aftermarket support a lucrative opportunity. Page S7.

Made to Order

Customizable accounting programs are gaining ground as users as well as consultants search for more exact solutions. Page S9.

Unified Design

An accounts payable and general ledger package helps home-furnishing company improve financial communication in a highly distributed operation. Page S9.

Vertical Hold

Demand for vertical-market accounting software is growing — despite the hefty price tag — as users demand more industry specifics. Page S11.

Product Chart

A detailed guide to microcomputer accounting software. Page S11.

SENIOR EDITOR
Joanne Kelleher

ASSOCIATE EDITOR
Penny Jansen

RESEARCHER
Sally Cusack

DESIGN EDITOR
Marjorie Magowan

ASSISTANT EDITOR
Bonnie MacKeil

Cover illustration:
John Alfred Dorn III

Managing by numbers is becoming easier with advances in accounting software's data exchange and reporting capabilities.

NUMBERS GAIN NEW MEANING

BY SHAWN BRYAN

KAREN STOLPER

Most people regard accounting as a necessary evil, an exercise that must be performed to satisfy the Internal Revenue Service and ensure the business is still afloat. By the same token, accounting software is considered a tool of the most mundane sort. That attitude is both unfortunate and misguided because changes are taking place in accounting software that promise to transform accounting from a bean-counting function into an integral part of management information. The emphasis is shifting from using numbers strictly to control finances to using them to communicate information about the totality of an enterprise.

Accounting software programs are beginning to take on attributes normally associated with financial modeling packages and other management information systems. This new orientation can be seen very clearly in the number of programs that now offer custom report generation, the most basic form of communication.

It wasn't very long ago that purchasing an accounting package meant learning to live with a limited menu of standard reports that could not be modified or augmented. Now, even the least expensive software packages offer users the ability to custom-design reports for their particular needs.

Another even more obvious change is found in the number of accounting programs that currently offer some sort of graphics analysis of information in the accounting files. Graphs used to be available only on spreadsheets or modeling programs, but many accounting programs now offer graphic presentation of elements such as ratio trends and cash flow. In some cases, accounting programs have even ventured into the territory of "what-if" analysis, which allows the entry of

theoretical data or assumptions about future events and then the projection of various possible outcomes. This type of activity has been almost the sole domain of modeling programs in the past and is the most recent breakthrough in some accounting programs.

Two trends just taking shape that bode well for the future are single-file and data-based accounting systems.

Most accounting software is file based, meaning the information for accounts payable is in an accounts payable file, the payroll information is in a payroll file, the receivables information is in a receivables file and so forth.

The problem with this approach is that, because each file has its own unique structure, records from one file cannot be easily joined with records from another. If a user wants something more than predefined reports, he has to reprogram the system.

Some software firms are addressing this problem by adding report writers to their libraries. MCBA, Inc. and Great Plains Software, Inc. have released report writers that allow the user to custom-design reports by drawing data from more than one file in the system. While this approach offers a quick and easy solution to the problem, an even more exciting development is the recent entry into the market of single-file or unified-file accounting systems.

If you view accounting as a series of

Bryan is vice-president of finance and administration for Cabot Farmers' Cooperative Co. in Cabot, Vt., and heads his own consulting firm, Datatek, in Montpelier, Vt.

Numbers

transactions that take place over time, then the unified-file system begins to make sense. What the concept says is that all the accounting transactions can be dumped into one big file. The computer then sorts out what is needed and the form in which it is needed. The result is a system in which all the data is available all the time.

Unified-file accounting systems do not recognize the normal close concept. The system is in all the time and does not have to be formally closed, except when you wish to remove historical data for archival purposes. For practical purposes, though, you can close the books any time you want, simply by specifying the time period you wish to see.

Quick-skip approach

Newviews, a highly touted accounting package from Q. W. Page Associates, Inc., uses this approach very effectively.

The program offers the user a visually familiar approach to accounting. The screen looks very much like a ledger sheet. You can look at an item on the ledger and then quickly move to the next level of detail to see the component parts. Repetitive use of the function that Q. W. Page calls Document Expand will, in fact, allow the user to get to the heart of the accounting system where the individual transactions reside.

For example, the accounts receivable item on the balance sheet is made up of various ac-

counts. Thus ACME Manufacturing becomes customer ACME rather than customer No. 1299. While easier to understand and remember, numerics are slower to use during data entry than the numeric identifications.

Newviews' visual approach to accounting is appealing, but its flexibility demands an investment from the user. Designing a large or complex system can be tedious, and just learning to work with the software requires a fair amount of practice and effort.

Another unified-file program with a more traditional interface is Keystone from Keystone Software.

THE development of unified-file systems on microcomputers augurs well for the future development of similar accounting systems for larger computers.

ware. Keystone is a fast, bombproof program that offers the same flexibility as Newviews with some additional features. Recognizing that most of accounting is data entry, the designers of Keystone made the program as fast as possible in this crucial area.

Keystone is also about as crash-resistant a program as you are likely to find. Data is written to disk as you enter it, so pulling the plug on the system has essentially no impact on your files. You simply plug it back in and start working where you left off. Newviews requires a more graceful exit, however, and will crash if you do not use the proper exit procedures.

Keystone uses indexes to knit general-ledger accounts to subaccounts, which are the banks, customers, vendors and others with whom you do business. General accounts are the traditional accounts found on a company's financial statements.

These indexes can be used any time you wish to create direct relationships between the detail and general levels. Once grasped, the concept behind the system is beautiful in its simplicity and is a perfect supporter of the transaction-based system.

What is most exciting is that the development of unified-file systems on microcomputers augurs well for the development of similar accounting systems for larger computers. The advent of larger, faster systems with increasingly more storage makes unified-file accounting even more plausible. The speed and storage capacities of mainframes makes this concept a natural and

counts for firms that owe your company money. The account for each firm is composed of invoices and payments, and each invoice is made up of individual items for which you have charged the company.

With one file, Newviews gives you a total accounting system, because it allows complete flexibility in designing reports and viewing data. You design all reports and views for your system from scratch. Each sheet requires definitions concerning which accounts get summarized into the totals being viewed.

Also, Newviews goes against the grain of traditional accounting software by suggesting the use of mnemonics rather than account numbers to identify ac-

WITH one file, Newviews gives you a total accounting system, because it allows complete flexibility in designing reports and viewing data.

Forecasting financial futures with models

If accounting systems specialize in recording history, then modeling programs are the specialists in predicting the future.

A financial model allows a user to simulate how a business works or might work, extracting instructive trends from the past and combining past performance with variables for forecasting.

Unlike spreadsheets, which offer the most basic form of modeling, or accounting programs, true modeling packages, of which there are perhaps 20 to 25 on the market, are designed with one application in mind: To create well-documented models.

Modeling programs such as Javelin Software Corp.'s Javelin and Encore from Ferox Microsystems, Inc. use descriptive variables to hold data and permit multiple manipulations with the same data set. Data is kept separate from the matrix in which it is manipulated and displayed.

Data analysis

The best of both worlds is to have a modeling program and an accounting program that can trade data easily. You can then extract historical data from the accounting system, manipulate it in the model and even put it back into the accounting software.

Fortunately, software developers have been sensitive to this need to share information, and most modeling programs, as well as many of the newer accounting systems, offer data import and export capabilities.

IFPS from Execucom Systems Corp. is a modeling program that offers a useful data-sharing feature. Available in mainframe as well as microcomputer versions, each has a built-in communications protocol that makes the movement of models from system to system transparent to the user. This frees the host system from supporting many people working on models while keeping mainframe averages open for the extra large models or those that require access to other mainframe software and data.

One of the beauties of some modeling programs is that they are nonprocedural; thus, you can define your model in any order and it will execute properly.

Javelin is a good example of such software. This program uses a single file to hold data and the model, so you can set up any number of views that you wish. Once relationships are established, it makes no difference in what order they are displayed, as the answers will still be correct. Once you get over the shock of working nonprocedurally, the Javelin approach is refreshingly

simple and lifelike.

If there is a drawback to the Javelin approach, it is that the entire model remains in one file. This does not pose much of a limit with Javelin's support of the Expanded Memory Specification (EMS) and enhanced EMS systems now available. Models of 2M, 3M, 4M bytes or more are possible. The problem is that the data and the model logic are in one file, and several models cannot share the same data easily.

Encore solves this by keeping the data and the model in completely separate files. Several models can use the same set of data, or several data sets can be used by one model. It is a more flexible way of working with large models.

Encore is a procedural system, however, so model design is more important. The model executes from the top down and will fail if it encounters a statement that needs information from a variable that is not yet defined.

Exotic modeling

Modeling programs are used routinely by businesses to forecast and analyze cash flow, sales and expenses. Models are not limited to just these routine applications, however.

Real estate developers use models to simulate various occupancy rates in condominiums and to evaluate various tax implications of their building and sales strategies. Bankers use models to review financial statements furnished to them by businesses seeking loans. In fact, the bank's modeling program often reviews a model created by a business — models testing models, as it were. Accountants use models to assist in planning tax strategies for their clients. Businesses use models to analyze new product introductions, especially those in which large capital outlays are required.

Models can also be used in science, agriculture and almost any endeavor at which numbers are used to analyze or predict.

What sets modeling programs apart from accounting software? They allow more freedom of expression. Whereas modeling programs are designed to encourage you to tinker with the data, accounting programs are designed primarily to prevent unauthorized tinkering with it. Modeling software generally permits "on-the-fly" changes in data and allows numerous changes to similar data sets. Accounting software is not designed for this type of free expression.

Modeling programs usually offer an extensive graphics rep-

ertoire. In most modeling situations, you would want to identify and deal with the data at the macro rather than the micro level. Graphs allow you to spot minor anomalies quickly, freeing you to concentrate on the underlying assumptions that make the model work.

Since experience tends to reject itself, modeling graphs also make it easy to spot trends from historical data and carry them forward into the future. If the trend varies remarkably from the historical pattern, there should be a good reason why.

Modeling software normally has excellent report-writing capabilities designed for external reporting. They often contribute to the development of a formal presentation, whether on a new product or on last year's sales.

The unique language of modeling programs could be called a programming language, but it is actually a control language that often resembles English. This language is easy to use; it what drives the data gathering and reporting functions of a model.

Using the control language, models can be put together to prompt user input and then offer menus of options. An inexperienced user can be made productive through the use of menus

MODELS can also be used in science, agriculture and almost any endeavor in which numbers are used to analyze or predict.

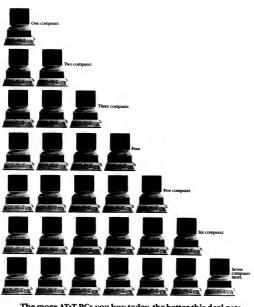and Help screens, and the company can rest secure knowing that the model logic being used is tested and bug-free.

This feature of modeling software is especially helpful in large companies where the MIS department writes the models and then distributes them to the departments needing them. The model users do not need to know how the model works, just what to put into it.

Modeling programs lend themselves very well to the personal computer environment, in which the geared rule mandates one user on the system at a time. This allows the model user to work with data from the host but frees the host machine of the support tasks associated with models running on larger systems. This can extend host system resources. It also means the MIS team can offer more hands-on experience while backing off a personal-computer system. The model user gets instant response, something often lacking in the host environment.

Modeling programs do not offer crystal-ball glimpses into the future, but they do permit a logical study of the past and encourage creative study of the possibilities.

SHAWN BRYAN

One computer.

Two computer.

Three computer.

Four.

Five computer.

Six computer.

Seven computer more.

The more AT&T PCs you buy today, the better this deal gets.

Now, more than ever, it pays to put AT&T confidence on everybody's desk. For a limited time, every AT&T PC you buy earns you dollar credits towards any further AT&T purchase at the same location.

With each PC, your credit jumps. From $100 to $240, $420, $640, $900, $1200. And more.

You can use your credits just like money on your next AT&T computer. Or on AT&T's STARLAN Network. Or any AT&T modem or FAX machine. Even AT&T Long Distance service—everything you need to put business people and computers in touch.

P.S. All by themselves, AT&T PCs give you a head start on the future. No computers made today are a better fit with the hardware and software you already have. None offer more ways to upgrade your system — in your own way, at your own pace. For quality, technology, and bankvault reliability, nobody comes through like AT&T.

From equipment to networking, from computers to communications, AT&T is the right choice.

AT&T
The right choice.

See your participating AT&T dealer or call today: 1 800 247-1212, Ext. 758

Wooed by the frills, won by the basics

BY BECKY BATCHA

For one of Canada's largest conglomerates, an initial attraction to the flashier aspects of microcomputer financial software — modeling, "what-if" analyses, graphics and the like — has deepened into a dependence more substantive than originally envisioned. George Weston Ltd., a broadly based company with interests in food products, fisheries and the forestry industry, now relies on its personal computer package as the cornerstone of its financial reporting structure.

George Weston, which recorded sales of $10 billion (Canadian) last year, began using Ferox Microsystems, Inc.'s Encore financial modeling package in its corporate headquarters in 1983. According to Geoff Flood, information systems officer at the Toronto-based firm, early

Batcha is a free-lance writer based in Boston.

users tapped mainly into the package's planning and forecasting features.

"Initially, we were excited about the modeling and analysis capabilities of the program," Flood says. Analysts at the corporate level manipulated financial data to gain better perspective on the corporation's direction. In the process of pursuing their forecasts, these early users discovered the general efficiencies of microcomputer software. They found it fast, easy to use and extremely capable, Flood says, especially in relation to the system it replaced.

Before George Weston installed the Encore package on in-house PCs, the company had channeled its financial modeling through a service bureau's mainframe. The microcomputer system bent the service bureau arrangement hands down, Flood says. "It was faster, and it had things like graphics — which

were unheard of then."

Under the service bureau arrangement, George Weston paid tens of thousands of dollars each year to crank out its financial reports, and turnaround was slow. The in-house microcomputer system, Flood says, cut turnaround time in half.

Financial analysts were so pleased with the microcomputer modeling package that the firm slowly migrated the bulk of its bread-and-butter financial reporting to the new system.

Eventually, the central office mandated that each of its 50 operating companies and divisions maintain a dedicated IBM Personal Computer, running Encore and equipped with a modem, for the sake of streamlined financial reporting.

Today, every subsidiary runs its monthly financial results through the microcomputer software and sends its consolida-

tions to one of four divisional offices. A bakery with 15 plants, for example, gathers the 15 financial reports, consolidates them and sends one set of figures to the food processing division.

At the divisional level, financial officers consolidate the figures further, so that the food processing division, for example, comes up with one set of figures for all its constituent bakery and cookie-making companies. Each of the four divisions then passes its vital figures, via modem, to George Weston headquarters, where a PC on a local-area network receives the data.

With the information they receive, corporate officers track the operating companies' performance, looking for strengths and weaknesses as well as signals of future direction. The officers prepare and manipulate five-year plans and other models, performing "what-if" analyses to determine, for example, what effect a prospective acquisition might have on the corporation's overall financial results.

George Weston's policy is to allow its operating companies almost total autonomy, with operating decisions resting in the hands of the operating companies. Still, the corporate staff needs to maintain some checks, Flood says, and the reporting

> IN THE process of pursuing their forecasts, early users discovered the general efficiencies of microcomputer software.

system provides them. "It's important for us to have at least some understanding of how the companies are performing," he says. "The purpose of the system is financial control."

Although the company has come to rely on the Encore system for its bedrock reporting needs, it continues to encourage use of the package as a modeling and analysis tool. To increase activity at that level, George Weston signed a site-licensing agreement with Ferox this spring that allows unlimited use of the package. Between 50 and 100 employees now work with the software regularly, Flood says.

The operating companies and divisions support heavier PC activity than does the corporate staff and can take special advantage of the modeling tool, Flood says. "Some of them have taken it and have built systems of their own that are in some cases far more sophisticated than the one we have," he says.

Ironically, although the use of the software was initially imposed on the operating companies by the infrequently invoked power of corporate mandate, it has, Flood says, actually resulted in more independence. "They're able to have greater control over the numbers that they're reporting to us." ∎

Always watch your language

Machine dependence affects system price and portability

One of the things you may want to ask about your accounting program is, "What language is it written in?"

The possibilities are myriad and include Cobol, Basic, C, assembler, RPG, RPG-II, RPG-III, Ashton-Tate's Dbase, Micronus, Inc.'s Rbase, Micro Data Base Systems, Inc.'s MDBS-III and Data Access Corp.'s Dataflex, to name a few.

Why should you care about the language used to create your data base? Two reasons are foremost: portability and cost.

Some languages, such as Co-

bol, are fairly standard. There is a generally recognized standard for Cobol that means a program written in that language can be moved from one system to another and, with some modifications, can run well in a new environment.

Portability

This type of system-to-system portability can mean significant cost savings for people who are happy with their software but need hardware upgrades or changes. Some languages, however, are machine-specific and

difficult to maintain. A program written in assembler will generally run on only one type of machine and require a significant investment of time and effort if modifications are required. A minor hardware change may also more severely impact a machine-dependent language.

Source code provides another good reason to ask in what language your accounting system is written. If the program is written in a data base language such as Dbase, like SBT Corp.'s SBT series of accounting programs, you can purchase the source

code and a copy of the Dbase program and modify the accounting system on your own. You don't have to be as much of a technician to program in Dbase as you do in C.

If you aren't interested in honing your programming skills, there is often a number of competent programmers around who use the more common data base languages and can do maintenance programming for you at a reasonable cost.

Data extraction

One drawback to accounting systems written in a data base language is that the systems may tend to run slower than those written in a regular programming language.

Accounting systems written

in a common data base language may be easier to interface with other software than programs that use a unique file structure. There are many programs that can read and write Dbase and other data base language files directly, so extracting data from them may be less difficult than with other languages.

While the language used to write your data base may not be the first question that pops into your mind, you should remember to ask that before you buy your accounting program.

It may not change your decision, but it will make you a more informed purchaser, and it may allow you to better estimate the future costs associated with your accounting system.

SHAWN BRYAN

Numbers

evolutionary one.

McCormack & Dodge Corp., one of the largest accounting software firms in the country, is expected to be making some announcements soon that, according to Dean Redfern, M&D's corporate vice-president, will include references to data-based accounting, the second major trend developing in accounting software systems. Recent improvements in data base technology have, he says, spurred M&D to develop systems to take advantage of data-based accounting instead of file-based accounting. Data-based technology on large hardware systems has advanced to a point at which it can support new accounting system approaches.

A data base is a collection of information. In the case of accounting systems, the data base is a series of accounting transactions. The software manages the information, keeping track of where it is and what it looks like. Relational data base theory has evolved into practical application, and hardware and software combinations from several computer makers are starting to make flexible accounting systems a reality.

Relational data base technology is founded on a conceptual data base of relations, and all manipulations are accomplished by operations on relations. Using a nonprocedural language, it is possible to build new relations involving fields from several previously specified relations. What this means, Redfern says, is that "your widest informational dreams can come true."

M&D is also currently working on applying artificial intelligence and natural-language technology to accounting software. This, Redfern says, is a "leap to the next level of usabil-

ity in accounting software."

Accounting software is not just for large companies, however, and the cost of buying the latest technology is high. Fortunately, the difference in price between high- and low-end programs is shrinking.

There are some surprisingly complete programs on the market available for a very low price. Dac Software, Inc. started the trend with its Dac-Easy Accounting system originally priced at $49.95 (now $69.95), which included general ledger, accounts receivable and payable, purchase order, billing, inventory and forecasting functions. The market was ready for such a program, and Dac's product took off. Success encourages compe-

RELATIONAL data base theory has evolved into practical application, and hardware and software combinations from several computer makers are starting to make flexible accounting systems a reality.

tition, and now a number of programs for the position of the most full-featured, inexpensive program available.

While these programs often have some shortcomings, they offer an inexpensive solution to the accounting problems of a small business with limited accounting experience.

At the next level reside the integrated accounting systems. These provide more flexibility and features than the small systems, but their major limitation is that they work in only one hardware environment.

At the high end of the spectrum are various programs — such as MCBA's accounting/distribution system — that provide all the features and functions found on mainframe systems for a much lower price. In fact, many

mainframe systems can't touch these programs for versatility and flexibility. MCBA's system, for example, includes nine separate modules, each retailing for anywhere from $750 to $1,500, while other programs running on networks and minicomputers can end up costing hundreds of thousands of dollars.

In addition, MCBA's system runs on large and small computers, so you can start with a personal computer system and evolve into larger systems, such as Digital Equipment Corp.'s VAX line.

Programs such as the MCBA accounting system allow you to grow from your existing hardware to larger systems as the need arises.

This adaptability is a function of programming conventions. MCBA's accounting system is written in Cobol, a language that makes system-to-system transportability simple. Standards inherent in Cobol allow a program written for one system to run on another, provided the conventions are followed.

The variables

There are some prerequisites to shopping for accounting software. A thorough knowledge of the business you are going to be accounting for is a good place to start. You need to establish a chart of accounts if one doesn't exist. Frankly, most people would be well served to enlist the aid of their certified public accountant for this job. Constant changes in tax laws make proper design an annual review for many businesses. For example, the recent changes in business expense deductions requires revision of expense accounts for many companies. Various types of businesses require different accounting information to satisfy Internal Revenue Service needs, too. A partnership differs substantially from a corporation. State and local tax codes may also present unique problems.

SUPPORT FROM THE VENDOR of the program is just as important as the program itself. If the vendor does not offer on- and off-site training programs on a regular basis, be suspicious. In fact, most reputable software firms will not sell a large system without requiring training.

The second general rule is to spend enough time analyzing your business to be able to identify the things you need to know to keep it running smoothly and efficiently. If inventory is an important factor, be sure you can set up your accounts to provide you with the information you need.

Do likewise with receivables, payables and other aspects of your business. Every business has certain pressure points that require only a little change to have an undue effect on the entire operation. They work just like a lever, with a little change at one end making a great deal of change at the other. In some companies it is receivables or inventory. Make sure you know your pressure points, and then design your chart of accounts to give you the maximum amount of information about those points.

Before you begin the actual software selection process, you should try to estimate the amount of information you will be entering into the system on a regular basis. This will help you select hardware as well as software. If there is likely to be a lot of data entry, a multiuser system may be in order.

For all but the smallest businesses, fixed disk storage and reliable backup are two hardware musts. In this context, "reliable" means the purchase of a system that will encourage daily backup.

Armed with this hardware information, it's time to begin the software hunt. What are some of the key components to look for

in accounting software?

First, there must be some sort of general ledger. The general ledger is the heart of any accounting system, as it is home for the chart of accounts and the base to which all other functions report. From it, the balance sheet and the income statement are derived.

There are a number of other functions usually found in accounting software packages, either integrated into the general ledger or configured as separate modules.

An accounts payable program tracks vendors and check writing. It tells you who you owe, how much you owe them and when you owe it. It should also keep track of early-payment discounts so that you can write checks in time to take advantage of the discounts. Frequently, a purchase order program serves as the front-end for the accounts payable and/or inventory systems.

An accounts receivable section keeps track of who owes you money. It should offer the user as much flexibility as possible in obtaining reports about who owes how much and for what.

Included in the accounts receivable section or as a separate module is often an order entry system, which speeds the entry of orders from customers. This program should provide a complete record of which products are moving and which are not. Sales analysis is the secret to staying profitable. Quite often, the order entry program drives the accounts receivable system as well as the manufacturing

control system.

A payroll system is not uncommon and will sometimes trade information with other areas of the system to charge labor costs to manufactured inventory.

Manufacturing accounting systems may also include some kind of scheduling program to help track work in progress or organize the manufacturing process, also known as material requirements planning or MRP II.

Inventories also need to be tracked during the manufacturing process. A lot-tracking system for process manufacturers provides vital information about perishable, controlled or regulated products that might undergo a recall. Inventory control systems are often offered as free-standing modules.

THINGS ARE MOVING in the accounting software field, and the company that is not putting time and effort into research and development probably will not be in business in a few years.

Fixed-asset systems keep track of plant and equipment depreciation and may also double as inventory systems for fixed assets.

Other modules appear in systems, and many specialized application programs for specific industries have custom programs designed to handle just one aspect of the business.

A full-blown system can be an expensive and complicated investment, requiring considerable expertise to get it up and running. Even microcomputer systems can cost much more than $10,000 for software alone. Add to that the cost of systems consulting and design work and the training time it takes to get a system running, and you have a substantial capital asset in your accounting software, hardware and systems.

When you purchase a system of this size and complexity you need help getting set up, so support from the vendor of the program is just as important as the program itself. If the vendor does not offer on- and off-site training program on a regular basis, be suspicious. In fact, most reputable software firms will not sell a large system without requiring training. Their reputation is hurt by a bad installation, and that reputation is more valuable than a single sale.

If you choose the right vendor and the right software, you will be well on your way to a successful installation.

There are many changes worthy of note in accounting systems. These make great topics of conversation with your software vendor. If you get a blank look from the sales representative, you may want to reconsider the firm he represents. Just as in every other aspect of technology, things are moving in the accounting software field, and the company that is not putting time and effort into research and development probably will not be in business in a few years.

There is no "best" accounting system. As with all things in life, various choices offer various strengths and weaknesses.

THERE is no "best" accounting system. As with all things in life, various choices offer various strengths and weaknesses. What is encouraging is that technology is making improvements possible in accounting systems.

What is encouraging is that technology is making improvements possible in accounting systems.

The next few years will see expert systems and AI technology finding practical applications in accounting software. Expert accounting systems will be able to study incoming orders and optimize the production-line schedule without human intervention. Appropriate inventory levels will be maintained by systems that automatically know when to order replacement stock. Cash-flow management will be handled by systems that review trends and predict the future cash needs of a company based on the budget.

This is not a long-range forecast; people have already begun to produce prototype accounting systems using these technologies. The value of such systems is that they provide more and more information to those that need it, while relieving the drudgery associated with grinding out the numbers. M&D's Redfern is already talking about nondisruptive processing systems that come up once and never come down). AI and natural-language systems. "We are entering an era of significantly more unrestricted systems," Redfern says. "It is the software vendor's responsibility to take advantage of the advancements in systems software."

M&D and the other forward-looking firms have already seen the future, and they are building for it today. It remains for these innovative firms to seize the opportunity to work with more information and less data. That, ultimately, should be the goal of all accounting software. ●

The well-educated sell: CPAs take on software

BY ED SCANNELL

Asking computer retailers to devote less time to selling popular productivity packages and more time to selling accounting software is like asking an 8-year-old to eat fewer M&Ms and more brussels sprouts.

What has always made selling accounting software to corporate accounts an unattractive proposition, at least for dealers, is the extensive aftermarket support required. Because few dealers have certified public accountants on their staffs, they rarely ask a customer all the right questions at the point of sale and, consequently, are continually fine-tuning installed multiple-module programs.

"I actually go out of my way to discourage my people from selling [accounting software], because the sale never seems to end," says one large East Coast dealer who requested anonymity.

This attitude has been one of the most important factors holding back sales of microcomputer accounting software since it was introduced in the late 1970s.

There is some relief in sight, however. During the past year, vendors and dealers have been finding an increased willingness on the part of the Big Eight and large regional accounting firms to sell and support accounting software. Many vendors say they believe this will create greater awareness and stimulate sales.

"Until recently, nobody appreciated the lucrative accounting software market," says David Samuels, president and chief executive officer of State of the Art, Inc., a Costa Mesa, Calif.-based developer of accounting packages. "But in the past 12 months, we've begun to see some genuine interest."

"I think the accounting software vendors now understand that this market belongs to the certified public accountant," says Wayne Harding, founder of Wayne Harding Associates, an accounting firm in Denver. "The bottom line is that accounting software is integral to the services provided by public accountants."

Since 1983, Big Eight firms have been setting up groups to write and/or sell accounting software to corporate accounts. Arthur Andersen & Co. was the first Big Eight firm to develop and distribute its software to clients in the early 1980s.

Most accounting firms have long been willing to write or customize software for their clients. Until recently, however, all but one or two were hesitant about endorsing or selling their suppliers' packages, fearing it would compromise their integrity if they went to endorse one package over another. Now, many preserve that integrity by endorsing products from two or three vendors, leaving the final selection up to the client.

While most Big Eight firms still will not readily admit to selling other suppliers' products, more are actively reselling third-party packages, according to several accounting vendors.

"Accountants are a natural conduit for data processing information, whether it is

Scannell is Computerworld's *senior editor, microcomputers.*

the evaluation of a system or ongoing installation or support," says Bruce Milne, president of Accountants Microsystems, Inc., a developer in Bellevue, Wash.

One example of the kind of relationships vendors and Big Eight firms are forming these days is the pending agreement between State of the Art and Deloitte Haskins & Sells. The two firms are scheduled to sign an agreement shortly under which the latter will add State of the Art's MAS 90 Master Accounting series to a list of packages it recommends to its clients and offer training for the package to all its accountants.
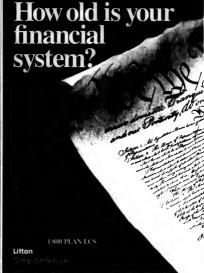
"Not all 100 offices [of Deloitte Haskins] will immediately become resellers of our applications," Samuels says. "Personnel are currently being trained in MAS 90 applications, and individual offices will withhold final determination on whether to become MAS 90 resellers or offer consulting services for the package for 90 to 120 days. But most want to be hooked up with a value-added reseller in their area that they can work with," he adds.

According to Rob Kuhns, senior man-

ager in the executive office at Deloitte Haskins, the firm has similar agreements with Computer Associates International, Inc. for its Easy Business Systems series and TLB, Inc. for its Solomon III package.

"With the number of packages out there today, it's impossible to know all of them well," Kuhns says. "We decided to centrally look at 30 to 40 and, from that, select two or three products that will fit the needs of our clients or potential clients."

The larger accounting firms are not waiting for accounting software developers to come to them. Some of the more aggressive firms are approaching developers. Many believe selling software and providing consulting services affords them an advantage over competitors that have not yet caught the wave. ∎

Altering the code to suit the business

BY SHELDON NEEDLE

Accounting systems that allow for some level of customization are attracting increasing interest from end users as well as consultants. Consultants favor these packages because they create a demand for custom-programming services. Users are drawn because standard off-the-shelf programs often lack specific capabilities, and they would rather change their software than their way of doing business.

There are currently some 15 to 20 accounting systems on the market that could be called customizable. Some, like Realworld Corp.'s and Open Systems, Inc.'s product lines provide modifiable source code. Others, like Reveille from Macro, Inc. in Houston and Pro-IV Accountant from Applications Systems Corp. in Laguna Hills, Calif., are written in fourth-generation data base systems.

These systems address levels of customization beyond modification of an invoice or report. Such modifications used to require modification of source code but now can be accomplished more simply. Many programs offer built-in service-design functions or ad hoc query and reporting programs that either come with the system or can be purchased separately. Examples are Open Systems' Report Writer and Great Plains Software, Inc.'s Report Maker Plus.

Customizable accounting software is most needed when standard systems are not configured to handle certain types of data or when complex calculations are required. For example, you may need to keep multiple sets of books for different currencies or consolidate purchase orders from different vendors.

The risk of customizing

Customizing methods involve varying degrees of risk. Changing code in applications software can be dangerous because vendors will not support systems containing code that has been modified. And, of course, custom programming can cost dearly.

Using a data base-driven accounting package can be a high-risk affair, because once you have access to the data base functions, anything can be done to the data files. There is really no restriction on changing information and compromising key

data. This risk applies to security as well, since users can easily change access codes with the data base functions.

A compromise to dealing with custom requirements is to handle them off-line. This means passing data from the accounting system to productivity software like Lotus Development Corp.'s 1-2-3 or Ashton-Tate's Dbase. While this approach involves extra steps and requires familiarity with more software, it protects the accounting data from unauthorized changes.

You should ask two questions before selecting your approach: How absolute is the need? Is data available in the master file?

> # Y
> OU should ask two questions before selecting your approach: How absolute is the need? Is data available in the master file?

available in the master file? If the answer to the second question is yes, there should be a way of getting it out.

Vendor solutions

Many accounting software vendors now offer tools that assist in modifying their systems. Some, like IBM's Business Adviser, feature data managers that work directly with the accounting files and create custom reports and data entry screens.

BPI Systems, Inc. offers Productivity Connection and Tool Kit for importing data to a system as well as for preparing special reports and analyses. The data import features allow users to set up validation criteria. These are ideal tools for consultants and value-added resellers.

TLB, Inc.'s Solomon III offers an External Systems Interface program for importing data directly to Solomon III files. Business Systems offers its accounting software along with easily integrated EasyFiler, Easywriter and Supercalc spreadsheet, all from Computer Associates International, Inc.

Some companies will never require more than off-the-shelf accounting packages. For others, however, a customizable package offers the only reasonable solution for handling unique requirements. The key is to understand your company's particular needs and what is required to satisfy them. ∎

Needle is president of Computer Training Services in Rockville, Md., publisher of accounting software reference materials and The Guide to Accounting Software for Microcomputers.

Flexible accounting system furnishes needed efficiencies

BY SALLY CUSACK

At the Danbury, Conn., headquarters of Ethan Allen, Inc., a mainframe accounting system allows the home furnishings company to track accounts payable functions for its 16 warehouses and its distribution and service centers across the country.

Simple, easy to use and flexible are the three adjectives that Joseph Hart chooses to use when discussing Global Accounts Payable and Global General Ledger, accounting systems from Global Software, Inc. Hart is corporate division controller at Ethan Allen, a division of Interco Corp. All accounting functions for the scattered warehouses and centers are handled by his office.

Ethan Allen installed Global Software's on-line accounts payable, general ledger and financial reporting system on an in-house IBM 4341 two years ago, after using an earlier version of the software for several years for batch-processing.

"As business and volume increased, we were looking to gain efficiency from the accounting system. Sixty percent to 70% of our general-ledger transactions come from accounts payable ac-

> # T
> HE INTEGRATION, which was accomplished with some in-house programming, has resulted in daily reconciliations that are completed in ten minutes.

tivity," Hart says. "We wanted a centralized function without increasing our staff."

Necessary integration

The company needed a product capable of integrating with its financial system, which include inventory control and sales statistics programs developed in-house. Ethan Allen's large volume of transactions makes it essential for the in-house programs to integrate with accounting and general ledger functions.

The integration, which was accomplished with some in-house programming, has resulted in daily reconciliations that are completed in 10 minutes. A transaction-processing program was also developed, a program Hart

finds invaluable to his operations.

Another software vendor with a product found in the Ethan Allen shop is Natick, Mass.-based McCormack & Dodge Corp., whose accounts receivable package is used in

Ethan Allen's credit department. Hart says Global was a "very close" second choice for that application, but the company found that McCormack & Dodge offered a slight edge in credit functions with the accounts receivable program.

Although Ethan Allen writes much of its own software, the firm decided that in-house development of an on-line accounting system would be unnecessary and time-consuming. Hart estimates it would take a minimum of two years to write such a program, with three to six months alone spent in the preliminary planning process.

"The accounting software marketplace is very competitive," Hart says. "There are 50 to 100 packages out there. It is easier to purchase a pretested product that will be maintained and enhanced by the vendor."

Making the rounds

Although Ethan Allen is based in Danbury, Hart and his staff travel frequently. Making the rounds of its warehouses is an important function in Hart's job, which keeps him in touch with the system that is so vital to his company. In Hart's management style, he periodically travels to warehouses, at which time he can enter data from his lap-top computer into the system over dial-up tele-phone lines to the company mainframe in Danbury.

When Hart joined Ethan Allen, he found that in-house development of software for accounts payable had been put on hold because the home office and its distribution points were not linked. Now, with an integrated system, all centers are on-line to Danbury, and Hart can access reports from anywhere.

"Before signing on that dotted line, I find it necessary to visit a user site — a user who has been up on the system for some time, perhaps even a user who has experienced problems," Hart says. "It is important to see the system with the reports and the on-line screens."

Hart also looked at many other software packages and viewed several different product demonstrations before deciding on Global.

Five days after installation, the system was on-line, with the accounts payable function up and running. Although the company's original intention was sim-

ply to handle a higher volume of transactions without an increase in the number of staff, Hart has actually reduced his accounts payable staff by one third in the past two years.

The Global accounting package handles invoicing, deliveries and stock receiving for the remote operations. All but the five service centers function on-line via terminals, and the company plans to connect them as well in the near future. Accounting is accomplished by product line, for example, wood furniture, case goods or accessories. All told, there is a total of 15 different lines, each categorized

> # B
> EFORE signing on that dotted line, I find it necessary to visit a user site — a user who has been up on the system for some time, perhaps even a user who has experienced problems."
>
> JOSEPH HART
> ETHAN ALLEN, INC.

into multiple subdivisions.

Millions of transactions

The accounts payable department processes 10,000 invoices monthly, with inventory control held responsible for several million transactions annually. By creating separate statements for individual operations, such as warehouse or trucking, the system increases the accuracy of local operations monitoring. The financial results are then distributed to all upper level executives, as well as to 16 distribution managers.

Hart is especially pleased with the program's report writer. Easy-driven, it eliminates the necessity of programming while allowing greater flexibility. Reports can be created quickly and then duplicated and distributed in different divisions without involving data processing personnel.

"The report writer function has resulted in two important gains," Hart claims. "Finance has a better knowledge of operations, and the field operations staff has a clearer picture of what finance is doing. The program is easy to read and produces the types of reports management wants to see — clean and concise." ∎

Cusack is a researcher at Computerworld.

The rise of vertical accounting software

The accounting software market is taking on an increasingly vertical orientation. Packages designed for specific industries currently represent more than half of all accounting software sales, according to the market research firm Future Computing, Inc. Demand for more precise and defined solutions will continue to fuel this trend.

There is no clear division between the functionality of horizontal or general-purpose accounting software and vertical software. Indeed, one of the major horizontal vendors, Great Plains Software, Inc. in Fargo, N.D., estimates it has customers in more than 400 industries.

So what defines a vertical package? In two words: specialization and price. Vertical-market packages are highly specialized to meet the needs of a particular industry and usually cost from two to four times as much as their generic counterparts.

For example, a vertical-market construction system typically costs between $6,000 and

$8,000, while a horizontal system with job costing included falls between $2,000 and $3,500. In some cases, the degree of specialization justifies the price, but there are also many packages on the market that are priced for vertical ability more in name than reality.

Characteristics

Typically, today's vertical software performs well in one capacity but weakly in general applications. It is not unusual to find a construction package with an outstanding job-cost capability but a mediocre general-ledger or accounts payable system.

Some examples help to demonstrate the difference between a vertical and horizontal package in selected industries. For manufacturers, a horizontal system may offer a midlevel bill of materials function, but a true vertical-market system will also include manufacturing resource planning and shop floor control.

A horizontal construction system will offer cost-to-complete reporting and possibly retention accounting, but vertical packages may also offer estimating, subcontractor control and change-order control.

Market penetration

Software vendors are more precisely defining vertical-market opportunities. In the health field, vendors will segment a market by Standard Industrial Classification codes and break down health-care services into such categories as physician offices, nursing homes, hospitals and clinics. Other areas of significant activity in the vertical market are point of sale, manufacturing and real estate and property management. Companies generally choose to concentrate on those markets in which they can offer the best fit.

Vendors are also working closely with value-added resellers (VAR) to provide the right vertical-market solution. They see VARs as partners that can provide a total accounting solution in a vertical market. This encompasses needs evaluation, installation, training and ongoing support.

Many users are looking for specialized software priced somewhere in the $1,000 to $3,000 range. Unfortunately, few such packages exist. So far, the market has successfully supported a price gap, although this situation is changing.

Targeting market needs

Some vendors, such as State of the Art, Inc. and Advanced Business Microsystems, Inc., are moving into this vacuum by developing strong, low-cost vertical-market packages for distribution and construction. These companies are working on job-costing systems that are reportedly more powerful than those offered by most horizontal vendors.

The best source of information on industry software are the associations particular to that industry. Some have even published industry-specific software directories. Datapro Corp. publishes a reference on vertical software.

Software manufacturers constitute another important source of vertical-market software information. Companies like Computer Associates International, Inc. — which develops Easy Business Systems — Open Systems, Inc. and Realworld Corp. publish their own directories of third-party developers that have modified their basic systems to meet special industry needs.

SHELDON NEEDLE

VENDOR VIEWPOINT
Software designers must merge finance, relational data bases

BY RICHARD LAWSON

Software designers of mainframe-based accounting and financial applications are entering a new realm — that of relational data base. Some designers are excited, others frightened. And there's the usual amount of foot-dragging going on in the middle.

But no one really has any choice. The market is moving

match the speed of the personal computer, but they can at least help the DP manager narrow the gap substantially.

Applying fierce from another direction is IBM, which has capitalized on a large but previously underutilized reservoir of expertise in relational technology with the development of both the DB2 relational DBMS, which runs in MVS, and the SQL/DS relational data base, which runs

from PCs to different brands of software. And the relational technology will offer the flexibility of data gathering and reporting that company executives and accounting managers want — like the ability to run on-line and match transactions simultaneously.

Drawbacks

But what about the trade-offs or the outright negatives? A major question lingers about the use of computer resources. Does DB2, for instance, really eat memory like a hungry elephant? And does it take up too much CPU capability?

Based on my experience in designing SQL-based application software for accounting systems such as general ledger, accounts payable and receivable, fixed assets and project accounting, I would have to say that the answers are the following: Yes, it uses more memory but not that much, and, yes, it uses more CPU, but it's not that bad.

There are challenges, of course. There will be conversion costs for taking the old systems and reprogramming for DB2 or SQL/DS, for instance. However, IBM's push is working, as is the pull from users, company executives and accounting managers,

THE COMPANY CONTROLLER wants the full capacity of the main mainframe, and he wants it available with the same kind of flexibility and speed he is accustomed to getting from his personal computer.

designers into relational data base environments, and it's happening fast.

Two primary forces are generating this movement. One is the pull of executive, accounting and DP management at user companies; the other is the push of major computer companies, most notably IBM.

Personalized system

What's happened on the user side of this application-merger issue is that executives and accounting managers have grown used to personal computers and their data bases. The company controller, for instance, can build his own system on his PC using a data base, and have a program up and running in approximately an hour.

That same company controller now wants more. He is demanding the full capacity of the main machine, and he wants it available with the same kind of flexibility and speed he is accustomed to getting from the PC he desk. When the controller goes to the DP department and expects instantaneous answers, it is useless for the DP manager to say, "Fine, but that will take at least three months, and it will cost you X amount of dollars."

However, that's exactly the answer the DP manager will, in fact, give the controller — if he doesn't have a built-in data base management system in his environment, particularly a relational DBMS. These tools cannot

in PC-DOS.

What IBM offered previously, in terms of a mainframe DBMS, was IMS. But IMS was constantly criticized as cumbersome, slow and expensive, and it faced steady competitive pressure — from Cullinet Software, Inc.'s IDMS and from the various flavors of relational data base technology offered by companies such as Unisys Corp., Hewlett-Packard Co. and Data General Corp.

SOFTWARE COMPANIES offering accounting and financial software that doesn't follow this data base orientation will be out of business sooner rather than later, because nobody is going to buy non-data-base-oriented accounting and financial software.

Now, IBM is pushing DB2 and SQL/DS very hard in order to maintain market control and feed everyone the IBM SQL technology.

As companies like Oracle Corp. have already seen, SQL is becoming the industry de facto standard for relational data bases, thanks to IBM's muscle and the fact that it is an excellent product.

Ten years from now, there will not be a viable mainframe machine on the market that doesn't utilize a very valuable data base. That data base will be relational and will be SQL-based or have an SQL interface.

This will make many corporate DP managers very happy. Finally, there will be an industry-standard DBMS they can work with, which will mean portability

which means that corporate DP departments don't really have a choice.

There is also no choice for the designers and developers of software packages for accounting and financial applications. Nowadays, software must be designed using the industry's generally accepted practices for normalized data bases. Software companies offering accounting and financial software that doesn't follow this data base orientation will be out of business sooner rather than later, because nobody is going to buy non-database-oriented accounting and financial software.

Pull or push, it comes to the same thing — something's always got to give and, in this case, it's going to be non-data-base systems. ♦

Lawson is a co-founder, chairman of the board and vice-president of research and development at Lawson Associates, Inc., a Minneapolis-based application software company.

Microcomputer accounting software

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES, FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATES COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
ACS, Inc. (714) 472-9148	ACS Accounting series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory	Yes	Yes	Yes	256K	Aston-Tate Dbase III, Lotus 1-2-3	No	$300 (per module)
	Pasm	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory	Yes	No	Yes	256K	No	No	$495 (per module)
ADS Software, Inc. (800) 672-4432	ADS General Accounting series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory	Yes	Yes	Yes	128K	Lotus 1-2-3, Aston-Tate Dbase III	No	$1,995 (total system cost)
AIMS, Inc. (800) 531-5167	AIMAS	Modular	General ledger, accounts payable, accounts receivable, payroll, sales order processing, purchase order processing, fixed asset, billing, word writer	Yes	No	Optional	128K	Paperback Multiplan, Lotus 1-2-3, Visucalc (via optional report generator)	No	$695 (per module)
AT&T/American Business Systems, Inc. (800) 247-1212	Business Accounting System	Modular	General ledger, accounts payable, accounts receivable, payroll, order and inventory management	No	—	—	128K	No	No	$2,325 (total system cost)
Accountants Software Co. (818) 883-0048	ABC Client Accounting	Integrated	Client accounting, payroll reporting, five payroll check writing	Yes	Yes	Yes	256K	No	No	$1,995 (total system cost)
Accountants Microsystems, Inc. (800) 426-8201	Business Partner series	Modular	General ledger, accounts payable, accounts receivable, payroll	No	Yes	Yes	384K	Any ASCII or DIF file, Lotus 1-2-3, Aston-Tate Dbase	No	$795-$1,995 (per module)
Advanced Business Microsystems, Inc. (714) 861-8722	Platinum series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory control, order entry, purchase order processing, job costing, bank book, report writer	Yes	Yes	Yes	256K	Lotus 1-2-3, any ASCII or DIF file	Yes	$295-$1,995 (per module)
Alpha Microsystems (714) 957-8500	Alphaledger	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory control, fixed-assets tracking, payroll, purchase order processing, check reconciliation, report writer	Yes	Yes	Yes	90K (per user)	No	Yes	Contact vendor
American Business Systems, Inc. (617) 893-2600	ABS Accounting	Modular	General ledger, accounts payable, accounts receivable, payroll, fixed assets, order inventory, report writer	Yes	Yes	Yes	128K	Lotus 1-2-3, Microsoft Multiplan, Lotus 1-2-3	Yes	Contact vendor
American Fundware, Inc. (800) 551-4458, (800) 227-7575 (in Colo.)	PC-Fund	Modular	General ledger, accounts payable, accounts receivable, payroll, fixed assets, obligation tracking, budget forecasting, donor receipts, security system	Yes	Yes	Yes	512K	Any package that supports ASCII files	Yes	$995-$1,995 (per module)
American Softech, Inc. (404) 391-9191	Mmm	Integrated	General ledger, accounts payable, accounts receivable, order entry, inventory control, payroll, job costing, sales analysis	Yes	Yes	Yes	512K	Lotus 1-2-3	Yes	$995 (total system cost)
American Standard Computers (864) 487-1789	Boardtown III +	Modular	General ledger, accounts payable, accounts receivable, order entry, sales invoicing, inventory, payroll, job costing, check reconciliation	Yes	Yes	Yes	256K	No	Yes	$995-$1,995 (total system cost including license fee)
Analytic Services, Inc. (713) 974-0043	Oasis	Modular	General ledger, accounts payable, accounts receivable, payroll, fixed assets, order management, distribution, financial and administrative expense, inventory and manufacturing	Yes	Yes	Yes	640K	Any ASCII file	Yes	$2,300-$3,000 (per module)
Applied Digital Corp. (609) 234-3466	Financial MGR	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory	Yes	Yes	Yes	64K	No	No	Contact vendor
Armor Systems, Inc. (306) 929-9753	Excalibur Plus	Modular	General ledger, accounts payable, accounts receivable, inventory control, point of sale, purchase order processing, payroll, billing, customer information and billing	Yes	Yes	Yes	256K	Lotus 1-2-3, any ASCII file	Yes	$395-$695 (per module)
	Brave Retail Management System	Integrated	Accounts receivable, billing, point of sale, inventory control	No	No	No	256K	Lotus 1-2-3, any ASCII file	Yes	$995 (total system cost)
	Brave General Accounting System	Integrated	General ledger, accounts payable, payroll	Yes	No	No	256K	Lotus Symphony, any ASCII file	Yes	$995 (total system cost)
Bedford Software Corp. (306) 263-0674	Integrated Accounting	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory, job costing	Yes	Yes	No	256K	Lotus Symphony, any ASCII file	No	$249 (total system cost)
Boss International (800) 551-0453	Boss Financial Series	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory control, order entry, invoicing, spreadsheet interface, time and billing	No	Yes	Yes	128K	Lotus 1-2-3, Microsoft Multiplan	Yes	$199-$1,595 (per module)
Bristol Information Systems, Inc. (617) 679-1051	BIAS	Modular	General ledger, accounts receivable, accounts payable, payroll	No	Yes	Yes	384K	Any ASCII file	Yes	$800 (per module)
CBM Associates, Inc. (516) 483-3133	The Accountant	Modular	General ledger, accounts payable, accounts receivable, order entry, payroll, inventory, purchase order processing, inventory management, payroll, human resources, job costing	Yes	Yes	Yes	256K	Lotus 1-2-3, Aston-Tate Dbase III	Yes	$1,395 (per module)
CIE Systems, Inc. (714) 660-1800	CIES Accountant/600	Modular	General ledger, accounts payable, accounts receivable and sales analysis, inventory control, order processing and invoicing	Yes	Yes	Yes	512K	No	Yes	Contact vendor
CYMA/McGraw-Hill Corp. (800) 292-3862	CYMA Professional Accounting series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory and order processing	Yes	Yes	Yes	128K	Paperback Software VP-Planner, Lotus 1-2-3, Aston-Tate Dbase II, III	Yes	$595-$995 (per module)

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from vendors.

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES, FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATES COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
California Software Products, Inc. (714) 973-0440	Baby/36 Financial Application	Modular	General ledger, accounts payable, accounts receivable, payroll, fixed assets	Yes	Yes	Yes	384K		Yes	$800 (per module)
Caso, Inc. (901) 226-8826	Eagle series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, checkbook	No	Yes	Yes	512K	Lotus 1-2-3	Yes	$595 (per module)
Certiflor Corp. (214) 484-7878	Certiflor	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, order entry and purchase orders	Yes	Yes	Yes	512K	Any ASCII file		From $895 (per module)
Chang Laboratories, Inc. (800) 972-8800	Rags to Riches	Modular	General ledger, accounts payable, accounts receivable, inventory control and time billing, payroll	Yes	No	Yes	256K (MS-DOS), 512K (Macintosh)	Lotus 1-2-3, Microsoft Excel, any file that supports Clipboard	Yes	$199.95 (per module)
Charter House Software Corp. (818) 891-9977	Charter House Accounting Systems	Modular	General ledger, accounts payable, accounts receivable, job costing, billing and inventory, payroll, order entry, purchase orders, data link and report writer	Yes	Yes	Yes			Yes	$700-$1,700 (per module)
Chilton's Management Controls, Inc. (714) 980-5338	Chilton's Management Accounting Package	Modular	General ledger, accounts payable, accounts receivable, payroll, fixed assets	Yes	Yes	Yes	128K	Yes (no examples available)		$1,800 (per module)
Chuck Atkinson Programs (817) 249-0399	Quick Check	Modular	General ledger, accounts receivable, payroll	Yes	Yes	No	256K	No	Yes	From $49.95 (per module)
Colman, Organ & Co. (403) 483-5751	Costar	Integrated	General ledger, inventory control, financial reporting, point of sale, order entry, purchase order processing	Optional	Yes	No	640K	Yes	Yes	Contact vendor
Commercial Solution, Inc. (404) 252-9771	Accounting Classics	Modular	General ledger, accounts payable, accounts receivable, payroll	Yes	Yes	Yes	256K, 512K (depending on module)		Yes	$895 (per module)
Computer Associates International, Inc. (408) 432-1727	Easy Business Systems Accounting	Modular	General ledger, accounts payable, accounts receivable, payroll and sales analysis, job costing, inventory control and analysis, retail invoicing, time billing	Yes	Yes	Yes	128K	Lotus 1-2-3, Computer Associates Supercalc, Ashton-Tate Dbase, any ASCII, SYLK or DIF file	Yes	$149-$995 (per module)
Cone Software, Inc. (713) 590-2177	Plustek	Modular	General ledger, accounts payable, accounts receivable	Yes	Yes	Yes	512K	Any Datatlex product	Yes	$100 (per module)
Corporate Consulting Co. (617) 484-1715	Corporate Consulting Co. Integrated General Ledger Package	Integrated	General ledger, accounts payable, accounts receivable, payroll (optional)	Yes	Yes	Yes	512K	Proprietary	Yes	$4,500 (total system cost)
Crosswych Technologies Corp. (616) 406-9400	Pro-Fit series	Modular	General ledger, accounts payable, accounts receivable, inventory control, payroll, order entry, purchase order, ratio analysis	No	Yes	Optional	384K	Any ASCII or DIF file	Yes	From $895 (per module)
Custom Software Solutions, Inc. (414) 271-1500	Annex	Integrated	Client write-up, after-the-fact payroll, time billing, due-date accounting	Yes	Yes	Yes	256K	Any ASCII or DIF file	Yes	$1,695-$2,995 (total system cost)
B & S International, Inc. (901) 363-3939	Sterliiti Management System	Modular	General ledger, accounts payable, accounts receivable, order entry, inventory, purchase order, payroll, sales reporting	Yes	Yes	Yes	512K	Ashton-Tate WKS file, Lotus 1-2-3, Ashton-Tate Dbase III	Yes	$500-$2,000 (total system cost)
Dac Software, Inc. (214) 458-0038	Dac-Easy Accounting 2.0	Modular	General ledger, accounts payable, accounts receivable, billing, purchase orders, inventory and forecasting	Yes	Yes	Yes	256K	Lotus 1-2-3	Yes	$69.95 (total system cost)
Data Graphics, Inc. (612) 263-0004	Sr. Accountant	Integrated	General ledger, accounts payable, accounts receivable, inventory, graphics, trial balance, monthly reports	Yes	Yes	Yes	512K	No	Yes	$99.95 (total system cost)
Datacenter Business Center (a division of Corestanet, Inc.) (304) 456-6877	York SL Software	Modular	General ledger, accounts payable, accounts receivable, purchase order, sales order processing, inventory management, payroll, job costing, inventory routing, bill of material	Yes	Yes	Yes	128K	Lotus 1-2-3	Yes	Contact vendor
Dearman, Inc. (714) 738-8116	Pro Accountant	Modular	General ledger, accounts payable, accounts receivable, inventory control, sales order entry	Yes	Yes	Yes	512K	No	Yes	From $800 (per module)
Desob Systems, Inc. (513) 223-4849	Desob Construction Accounting and Estimating	Modular	General ledger, accounts payable, accounts receivable, payroll, job costing, inventory, purchase order, time billing, equipment control, estimating, report writer	Yes	Yes	Yes	256K	Any ASCII file	Yes	From $895-$1,995 (per module)
Digital Software Corp. (216) 360-1040	Gold Software	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory, report writer	Yes	Yes	Yes	128K	Yes, no examples available	Yes	Contact vendor
Financial Information Systems, Inc. (800) 527-4681 (214) 680-9096 (in Texas)	Multipac	Modular	General ledger, accounts payable, accounts receivable, inventory, payroll, job costing, checkbook manager, data base manager, departmental accounting	Yes	Yes	Yes	320K	Any ASCII or SYLK file	Yes	$595 (per module)
	Powerpac	Integrated	General ledger, accounts payable, accounts receivable, inventory	Yes	Yes	Yes	256K	No	Yes	$785 (total system cost)
Fiscal Systems, Inc. (205) 772-8920	Fiscal Business Management System	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory control, point of sale, sales order processing, purchase order processing	Yes	Yes	Yes	256K	Inforials	Yes	$595-$795 (per module)
Frontrunner Microcomputer Corp. (800) 654-7494 (818) 376-1322 (in Calif.)	CPA Plus	Integrated	General ledger, accounts payable, accounts receivable, inventory	Yes	No	Yes	384K	Paperback Software VP-Planner	No	$199 (total system cost)

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES, FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATES COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
G. B. Systems, Inc. (714) 863-1811	The Business Manager	Integrated	General ledger, accounts receivable, accounts payable, order entry, inventory control, purchase order processing, job costing, fund assets, sales reporting	Yes	Yes	Yes	256K	Any ASCII file	Yes	$2,500–$6,000 (total system cost)
Great American Software, Inc. (800) 528-5015	One-Write Plus	Modular	General ledger and checking, accounts payable, accounts receivable, payroll, transfer utility	No	No	Yes	256K	Any ASCII, SYLK or DIF file	No	$79.95–$295 (per module)
Great Plains Accounting Software, Inc. (800) 345-3276	Great Plains Accounting series	Modular	General ledger, accounts payable, accounts receivable, inventory, order entry, purchase order processing, report writer, network manager	Yes	Yes	Yes	384K	Lotus 1-2-3, Ashton-Tate Dbase, any ASCII or DIF file	Yes	$395–$895 (per module)
Hal Systems and Services, Inc. (314) 248-8608	PerfoUNet	Integrated	General ledger, accounts payable, accounts receivable, cost control billing, revenue distribution	No	Yes	No	256K	Lotus 1-2-3	Yes	$10,000–$15,000 (total system cost)
Saves Software (914) 273-3898	Small Business Accounting	Integrated	General ledger, payroll	No	No	No	128K	No	No	$198 (total system cost)
Hurricane Systems, Inc. (305) 774-8888	Bussesemaster	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory, system utilities, letter processing	Yes	Yes	Yes	10M	Yes	Yes	$2,595 (total system cost)
IBM (800) 647-4700 or contact local IBM office	Business Advisor	Modular	General accounting, accounts payable, accounts receivable, payroll, order entry, inventory control, mutual creditors, information management	Yes	Yes	Yes	512K	Any ASCII or DIF file	Yes	$200–$980 (per module)
	Accounting Assistant	Modular	General accounting, accounts payable, accounts receivable and billing, payroll, inventory control and purchasing, job costing	No	No	Yes	256K	Any ASCII or DIF file	Yes	$595 (per module)
IHS Computer Services (703) 434-4177	AlyahOmega Business Management System	Integrated	General ledger, accounts payable, accounts receivable, payroll, sales and billing, inventory, cash receipts and disbursements, time management	Yes	Yes	—	2M	Lotus 1-0-3	Yes	$1,500 (average total system cost)
Idea Computers, Inc. (713) 342-5846	Iacct	Integrated	General ledger, accounts payable, accounts receivable, payroll, letter writing, fixed assets, mail	No	Yes	No	512K	Ashton-Tate Dbase III	Yes	$150 (total system cost)
	Imax	Integrated	General ledger, accounts payable, accounts receivable, payroll, letter writing, fixed assets, mail, sales	Yes	Yes	No	512K	Ashton-Tate Dbase III	Yes	$350 (total system cost)
	Iretail	Integrated	General ledger, accounts payable, accounts receivable, payroll, letter writing, fixed assets, mail, product processing	No	Yes	No	512K	Ashton-Tate Dbase III	Yes	$250 (total system cost)
Intellisource, Inc. (314) 630-1343	Intellisource	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, sales order processing, sales analysis, point of sale	Yes	Yes	Yes	512K	No	Yes	$995–$795 (per module)
Interactive Information Systems, Inc. (602) 790-6214	IFAS	Modular	General ledger, accounts payable, accounts receivable, order entry, payroll, fixed assets	No	Yes	Yes	512K	Oracle SQL Calc	Yes	$1,500 (per module)
International Microsystems, Inc. (800) 356-6253	Focus on Business	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory control, job costing, financial statement, professional services, medical management, wholesale management, legal and nonprofit management	No	Yes	Yes	512K (RAM), 10M (hard disk)	Any ASCII file	Yes	$850–$1,995 (per module)
James River Group, Inc. (612) 339-2521	Accounting for Micros	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, job costing	No	Yes	Yes	192K	Any ASCII file	Yes	$125–$195 (per module)
	Desktop Accountant	Modular	General ledger, accounts payable, accounts receivable, payroll	No	Yes	Yes	192K	Any ASCII file	No	$495 (total system cost)
	Open for Business 1	Modular	General ledger, accounts payable, accounts receivable, payroll (optional)	No	Yes	Yes	256K	No	No	$595 (total system cost)
	Open for Business 2	Modular	General ledger, accounts payable, accounts receivable, inventory, payroll (optional)	No	Yes	Yes	256K	No	No	$995 (total system cost)
James & Erickson Software Technology, Inc. (416) 491-0836 (In Canada) (214) 458-2420 (In U.S.)	James & Erickson Accounting Software	Modular	General ledger, accounts payable, accounts receivable, payroll	Yes	Yes	Yes	—	Yes	Yes	Contact vendor
K2S Information Systems, Inc. (604) 662-4100	K2S Integrated Accounting System	Modular	General ledger, accounts payable, accounts receivable, billing, bank reconciliation	Yes	No	Yes	256K	Any ASCII or DIF file	Yes	$495 (total system cost)
Keystone Financial Technologies, Inc. (712) 984-0563	Keystone Financial Management System	Integrated	General ledger, accounts payable, accounts receivable, payroll, job costing, government estimating	Yes	Yes	Yes	256K	Any ASCII or DIF file	No	$795
Keystone Technologies, Inc. (717) 975-7120	The Practice Management System	Modular	General ledger, accounts payable, accounts receivable, payroll, word processing	Yes	Yes	Yes	256K	No	Yes	$7,000 (total system cost)
LAW Systems, Inc. (612) 483-6831	Pro-Meca	Modular	General ledger, accounts payable, accounts receivable, payroll, financial statements	Yes	Yes	Yes	640K	Lotus 1-2-3	Yes	$2,300–$3,300 (per module)
Lake Avenue Software, Inc. (818) 351-5483	Assistant Controller series	Modular	General ledger, accounts payable, accounts receivable, enhanced financial reporting, inventory, order entry and invoicing, payroll, job costing, professional time and billing	Yes	Yes	Yes	384K	Ashton-Tate Dbase III, Framework, Lotus 1-2-3	In development	$595 (per module)
Landmark Software Systems, Inc. (501) 753-8180	Landmark Accounting and Financial Management Systems	Modular	General ledger, accounts payable, accounts receivable, financial reporting, fixed assets, job costing, commercial tenant accounting, cash management, general ledger accounting, brokerage accounting	Yes	Yes	Yes	Varies	Any ASCII file	Yes	$5,000–$20,000 (per module)

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES, FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATES COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
Likon Corp. (800) 453-3827	Likon Accounting Software	Modular	General ledger, accounts payable, accounts receivable, order entry and billing, inventory control, payroll, job costing, property management, client write-up	Yes	Yes	Yes	256K	Lotus 1-2-3, Symphony, Ashton-Tate Dbase, any ASCII file	Yes	$1,950-$3,900 (per module)
Link Systems International (201) 894-1388	Link Accounting System	Integrated	General ledger, accounts payable, accounts receivable, invoicing, purchase order, sales order, sales representative, information retrieval	Yes	Yes	Yes	64K	No	Yes	$1,500 (per module)
Linus Computer System (801) 532-7182	Linus Accounting System	Modular	General ledger, accounts payable, accounts receivable, inventory, invoicing, payroll	Yes	No	Yes	64K	Any ASCII file	Yes	$299-$399 (per module)
M & C Systems, Inc. (201) 730-3680	Finspec	Modular	General ledger, accounts receivable, accounts payable, sales analysis, payroll	Yes	Yes	Yes	256K	Any ASCII file	Yes	$3,000 (total system cost)
M & B Systems, Inc. (718) 963-5011	Myte Myke	Modular	General ledger, accounts receivable, accounts payable, order entry/billing, purchase order processing, sales analysis, inventory control	Yes	Yes	Yes	256K	No	Yes	$795-$1,495 (per module)
MCBA, Inc. (818) 242-9600	MCBA Accounting/ Distribution System	Modular	General ledger, accounts payable, accounts receivable, payroll, customer order processing, purchase order and receiving, inventory management, bill of materials, report writer, data bridge	Yes	Yes	Yes	256K	Lotus 1-2-3, Ashton-Tate Dbase III, Microsoft Multiplan, any ASCII, DIF or SYLK file	Yes	$750-$1,500 (per module)
MEC Software (813) 370-3387	Integrated Accounting System	Integrated	General ledger, accounts payable, payroll, financial analysis	No	No	Yes	256K	No	No	$395-$895 (per module)
MC Software, Inc. (916) 756-8104	Income	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, purchasing, sales order entry, report writer	Yes	Yes	Yes	512K	Any ASCII file	Yes	$695-$1,295 (per module)
Macola, Inc. (800) 468-0834 (800) 468-0835 (in Ohio)	Macola Financial Software	Integrated	General ledger, accounts payable, accounts receivable, payroll, sales order processing, payroll, customer order processing, purchase order and receiving, bill of materials processor	Yes	Yes	Yes	512K	Lotus 1-2-3, Ashton-Tate Dbase	Yes	$795-$895 (per module)
Management Information Systems Corp. (800) 872-6472	MIC Accounting System	Integrated	General ledger, accounts payable, accounts receivable, inventory, payroll	Yes	Yes	Yes	90K	Alpha Microsystems Alpha Base, Alpha Calc	Yes	$5,000-$15,000 (total system cost)
	Job Costing and Accounting System	Integrated	General ledger, accounts payable, accounts receivable, job costing, payroll, inventory, resource management, estimating, word processing	Yes	Yes	Yes	90K	Alpha Microsystems Alpha Base, Alpha Calc	Yes	$4,500-$20,000 (total system cost)
Macrosoft Corp. (800) 363-8120	Ready-to-Run Accounting with Lotus 1-2-3	Modular	General ledger, accounts payable, accounts receivable, inventory and order entry	Yes	Yes	Yes	384K	Lotus 1-2-3	Yes	$49.95-$99.95 (per module)
Maxamin Software Systems Corp. (916) 781-3800	Businessworks PC	Modular	General ledger, accounts payable, accounts receivable, inventory control, payroll, sales invoicing, invoice manager	Yes	Yes	Yes	384K	Lotus 1-2-3, Microsoft Multiplan, any ASCII or SYLK file	No	$395 (per module)
Mesquite Systems Inc. (801) 627-9700	Magnate	Integrated	General ledger, accounts payable, accounts receivable, inventory	Yes	Yes	Yes	32K	Any spreadsheet or data base that runs on Pick operating system	Yes	From $2,000 (total system cost)
Micro-Art Programmers (800) 362-0923	MBAccount	Modular	General ledger, accounts payable, accounts receivable, inventory	Yes	Yes	No	128K	No	No	$65-$99 (per module)
Micro Associates, Inc. (409) 982-2061	Micro Accounting series	Modular	General ledger, accounts receivable, accounts payable, sales invoicing, inventory control, payroll, job costing, network manager, application manager, productivity manager	No	No	Yes	256K	Any ASCII or DIF file	No	Contact vendor
	C*	Modular	General ledger, accounts payable, job costing, network manager, productivity interface	No	No	Yes	256K	Any ASCII or DIF file	No	Contact vendor
Micro Business Applications, Inc. (612) 894-3470	Micro Business Applications Accounting Software	Modular	General ledger, accounts receivable, accounts payable, payroll, inventory, purchase order processing, sales order entry, fixed assets, job costing, professional time accounting, multicompany option, network interface, integrated manager	Yes	Yes	Yes	128K	Lotus 1-2-3, Symphony, Ashton-Tate Dbase III, any ASCII file	Yes	$595 (per module)
Micro Computer Business Services (800) 367-0237	Complete Accounting Package V.4.1	Modular	General ledger, accounts payable, accounts receivable, order entry, inventory and purchase order, payroll	Yes	Yes	Yes	256K	Ashton-Tate Dbase, Lotus 1-2-3	No	$99.95 (total system cost)
Micro Financial Corp. (818) 961-0237	Flexware	Modular	General ledger, accounts payable, accounts receivable, inventory, payroll, purchasing, order processing, job costing	Yes	Yes	Yes	256K	Any SYLK or ASCII file	Yes	$795 (average per module)
Microplus Software, Inc. (707) 526-0101	Accounting Plus	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory, sales order processing, purchase order processing, point of sale	Yes	Yes	Yes	256K	Lotus 1-2-3, Computer Associates Supercalc, any DIF file	Yes	$495 (per module)
Micron, Inc. (713) 461-6363	Reveille Customer Accounting Software	Integrated	General ledger, accounts payable, report writer, accounts payable, accounts receivable, sales analysis, customer order processing, fixed assets	Yes	Yes	Yes	512K	Any ASCII file	Yes	$795 (per module)
Mid-American Control Corp. (800) 836-5818	Prompt Financial System	Modular	General ledger, accounts payable, accounts receivable, budgeting	Yes	Yes	Yes	256K	Lotus 1-2-3, Symphony	Yes	$1,000 (per module)
	Public Budgeting and Accounting	Modular	General ledger, accounts payable, accounts receivable, budgeting	Yes	Yes	Yes	256K	Lotus 1-2-3	Yes	$1,000 (per module)

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES, FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATES COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
Mitrol, Inc. (617) 933-9848	Mitrol ACC	Modular	General ledger, accounts payable, accounts receivable, fixed assets, cash management system	Yes	Yes	Yes	Varies	Any DIF file	Yes	$5,400 (per module)
Monogram, Inc. (313) 553-1190	Dollars and Sense	Integrated	Double-entry accounting, assets, liabilities, expenses, income, checking, income statements, balance statements, year-to-date summaries, cash-flow budget analysis, forecasting	Yes	Yes	No	256K	Yes (no examples available)	No	$179.95 (total system cost)
Mantech Systems, Inc. (818) 779-1728	Sequenz	Integrated	General ledger, accounts payable, accounts receivable	Yes	Yes	Yes	512K	Lotus 1-2-3, any ASCII	Yes	$1,400 (per module)
Nogales Industries (414) 636-6404	Standard Accounting Package	Modular	Payroll, accounts payable, accounts receivable, sales inventory and purchasing, general ledger, fixed assets inventory	Yes	Yes	No	256K	No	No	$190 (per module)
	Advanced Accounting Package	Modular	General ledger, accounts payable, accounts receivable, sales inventory and purchasing, fixed assets inventory	Yes	Yes	No	256K	No	No	$490 (per module)
O'Hanlon Computer Systems, Inc. (800) 545-5200	O'Hanlon Data Base Management series	Integrated	General ledger, accounts payable, accounts receivable, payroll, sales order entry, purchase order entry, inventory	Yes	Yes	Yes	256K	Lotus 1-2-3, Microsoft Multiplan, any DIF or SYLK file	No	$995-$995 (per module)
Open Systems, Inc. (800) 328-2276	Open Systems Accounting Software	Modular	General ledger, accounts payable, accounts receivable, inventory, purchase order processing, sales order processing, payroll, report writer, fixed assets, human resource management, job costing, project estimating, time and billing, resource manager	Yes	Yes	Yes	256K (DOS, 512K (Unix, Unix)	Lotus 1-2-3	Yes	$395-$995 (per module)
Osprey Business Software, Inc. (301) 621-0900	Osprey	Modular	General ledger, accounts payable, accounts receivable, invoice and sales order entry, inventory, payroll, purchase order, fixed assets, bill of materials, job costing, time and billing	Yes	No	No	128K	Lotus 1-2-3, Microsoft Multiplan, any CSV file	No	$295 (per module)
	Osprey Series VI.X, version sized to be available this fall	Modular	General ledger, accounts payable, accounts receivable, invoice and sales order entry, inventory, payroll, purchase order, fixed assets, bill of materials, job costing	Yes	Yes	No	256K	Lotus 1-2-3, Microsoft Multiplan, any CSV file	No	$750 (per module)
	Runaway	Modular	General ledger, accounts payable, accounts receivable, payroll, purchase order, inventory, invoice and sales order entry, job costing, time and billing, fixed assets, bill of materials	Yes	No	No	512K		No	$99-$299 (per module)
PEP Engineering (619) 481-7250	IES Accounting Software	Integrated	General ledger, accounts payable, accounts receivable, inventory, payroll	No	No	No	512K	Lotus 1-2-3, Symphony	Yes	$795 (total system cost)
Peachtree Systems, Inc. (212) 593-2080	PASSS	Integrated	Accounts receivable, accounts payable, general ledger, payroll, human resources	Yes	Yes	Yes	NA	Lotus 1-2-3, Symphony	Yes	$30,000-$80,000 (total system cost)
Peras Information Services Corp. (303) 790-0660	Integrated Business System	Integrated	General ledger, accounts payable, accounts receivable, inventory, report writer, job costing, order entry, purchasing, word processing	Yes	Yes	No	512K	No	Yes	$271-$990 (per module)
Peachtree Software, Inc. (800) 247-3224	Peachtree Complete Business Accounting System	Integrated	General ledger, accounts payable, accounts receivable, inventory, payroll, invoicing, job costing	No	Yes	Yes	128K	Lotus 1-2-3, Ashton-Tate Dbase II, any ASCII, SYLK or DIF file	No	$199 (total system cost)
Peerless, Inc. (800) 663-0660	Basic Accounting	Integrated	General ledger, accounts payable, accounts receivable, invoicing, payroll, inventory	Yes	Yes	No	256K, 640K (Framework)	Ashton-Tate Framework	Yes	$495 (total system cost)
Personics Hotel Professional System (800) 343-3069	Financial Reporting	Modular	General ledger, departmental general ledger, accounts receivable, accounts payable, fixed assets	No	Yes	Yes	NA	Any ASCII file	No	$3000-$3000 (per module)
Premark, Ltd. (800) 221-9916	MAI Integrated Accounting series	Modular	General ledger, accounts payable, accounts receivable, inventory control, payroll, order entry, sales analysis, financial statements, fixed assets, purchase order, report writer, data link	Yes	Yes	Yes	256K, 398K (report writer)	Any ASCII, DIF or CSV file	Yes	$245-$795 (per module)
Princeton, Inc. (800) 548-8744	Company Magic	Modular	General ledger, accounts payable, accounts receivable, inventory, payroll	Yes	Yes	Yes	256K	No	No	$3,200 (total system cost)
Q. W. Page Associates, Inc. (416) 823-4567	Newview	Integrated	General ledger, accounts payable, accounts receivable, work-in-progress reports, cash flow, balance sheet, income statement, payroll, time and billing, sales and order entry, job costing, consolidations, client write-ups	Yes	Yes	Yes	512K	Any ASCII file	No	$495 (total system cost)
Quasar Associates, Inc. (201) 288-1313	General Accounting	Modular	General ledger, accounts payable, accounts receivable, payroll	No	No	No	384K	Optional	Yes	Up to $4,400 (per module)
Realworld Corp. (800) 255-1115	Realworld Accounting System	Modular	General ledger, accounts payable, accounts receivable, payroll, order entry and billing, inventory control, sales analysis, job costing, purchase orders, check reconciliation	Yes	Yes	Yes	256K	Lotus 1-2-3, any ASCII file	Yes	$495 (total system cost)
	4-in-1 Basic Accounting	Integrated	General ledger, accounts payable, accounts receivable, payroll	Yes	No	Yes	256K	Any ASCII file	No	$195 (total system cost)
Red Wing Business Systems, Inc. (612) 388-1100	Red Wing Accounting Software	Modular	General ledger, accounts payable, accounts receivable, inventory	No	Yes	Yes	128K	Lotus 1-2-3	No	$99-$300 (per module)
Ross Systems, Inc. (415) 856-1100	MAPS series	Integrated	General ledger, accounts payable, accounts receivable, fixed assets, modeling, micro link, data base, cross-view	Yes	Yes	Yes	2M	Any DIF file	Yes	$5,000-$23,000 (per module)

COMPANY	PRODUCT	MODULAR OR INTEGRATED PACKAGE	STANDARD MODULES/FUNCTIONS	OFFERS USER-DEFINABLE REPORT FORMATS	CREATE COMPARATIVE STATEMENTS	POSTS RECURRING TRANSACTIONS	MINIMUM MEMORY REQUIRED (IN BYTES)	INTERFACES WITH EXTERNAL SPREADSHEETS, DATA BASES	OFFERS MULTIUSER CAPABILITIES	PRICE
S & S Programming, Inc. (817) 633-6473	CPA	Modular	General ledger, accounts payable, accounts receivable, order entry, business inventory, payroll, budget cash flow, enterprise analysis	Yes	Yes	No	256K	No		$495-$995 (per module)
SBT Corp. (415) 331-9900	Data Base Accounting Library	Modular	General ledger, accounts payable, accounts receivable, payroll, time and billing, sales order processing, billing and inventory control, payroll, assets, job cost accounting, check writing, property, manufacturing, resource planning	Yes	Yes	Yes	512K	Ashton-Tate Dbase III, Framework, Lotus 1-2-3, Microsoft Multiplan		$95-$595 (per module)
San Luis Software, Inc. (805) 466-6506	TABS	Modular	General ledger, accounts payable, accounts receivable, payroll, name and address, inventory control, point of sale, serialized inventory, multiformat inventory, bins and mins quotations	Yes	—	—	—		Yes	$900-$2,500 (per module)
Semaphore, Inc. (212) 697-1196	Semaphore Financial Manager	Modular	General ledger, accounts payable, accounts receivable, job costing, financial analysis	Yes	Yes	Yes	256K	Any ASCII file		$100-$500 (per module)
Sierra On-Line, Inc. (209) 683-6858	Mac Use Write	Modular	General ledger, accounts receivable, cash flow	No	No	Yes	512K	Microsoft Excel, Multiplan, Lotus Jazz		$69.95 (per module)
Softview, Inc. (213) 589-3080	Accountant Inc. (Commodore 128 version)	Modular	General ledger, accounts payable	No	No	Yes	128K	No	No	$99.95 (total system cost)
	Accountant Inc. (Macintosh version)	Integrated	General ledger, accounts payable, accounts receivable, inventory, financial analysis	Yes	Yes	Yes	512K	Any ASCII file	In development	$99.95 (total system cost)
Software Shop Systems, Inc. (800) 554-5665	Construction System	Modular	General ledger, accounts payable, accounts receivable, payroll, job costing, inventory	Yes	Yes	No	256K	Lotus 1-2-3, Computer Associates Supercalc, Ashton-Tate Dbase III, any DIF file		$2,000 (per module)
Software Technology, Inc. (402) 423-1440	TABS III	Modular	General ledger, accounts payable, trust accounting, critical date	Yes	Yes	Yes	192K	Any ASCII file		$200-$2,500 (per module)
Specialized Information Systems, Inc. (800) 358-0095 (800) 762-7700 (in Calif.)	Accountants	Modular	General ledger, accounts payable, accounts receivable, order entry, purchase orders, manufacturing/inventory control, time and billing, fund accounting, telemarketing, job costing, payroll	Yes	Yes	Yes	512K			$195-$1,195 (per module)
Southware Innovations, Inc. (800) 547-4179	Southware Business System	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, sales	Yes	Yes	Yes	256K	Any DIF file		Contact vendor
Star Software Systems, Inc. (800) 243-7221	Accounting Partner Plus	Integrated	General ledger with double-entry writing, accounts receivable with invoicing, accounts payable with check writing and purchasing, automatic payroll	Yes	Yes	Yes	256K	Proprietary, any ASCII or DIF file		$795 (total system cost)
	Accounting Partner	Integrated	General ledger, accounts payable, accounts receivable, purchase invoicing, payroll	Yes	Yes	No	256K	Any ASCII file		209 (total system cost)
State of the Art, Inc. (800) 854-3415 (800) 422-3151 (in Calif.)	MAS 90 Master Accounting series	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory management, sales order processing, purchase order processing, bank reconciliation, job cost and analysis, library master	Yes	Yes	Yes	512K	Lotus 1-2-3, Ashton-Tate Dbase III and compatibles		$795 (per module)
Systems Plus, Inc. (415) 969-7047	Double Entry	Modular	General ledger, accounts payable, accounts receivable, invoicing, payroll	No	Yes	Yes	256K	No		$695 (per module)
TCS Software, Inc. (800) 321-6454	TCS Total Accounting System	Modular	General ledger, accounts payable, accounts receivable, sales order entry, invoice control, fixed assets depreciation, payroll, purchase orders	Yes	Yes	Yes	256K	Lotus 1-2-3, Symphony, Microsoft Multiplan, any ASCII file		$595-$795 (per module)
TOM Software, Inc. (206) 566-7022	TOM Software Commercial System	Modular	General ledger, accounts payable, accounts receivable, order entry, invoice control, payroll, purchase order, order entry, inventory	Yes	Yes	Yes	64K	Proprietary		Contact vendor
Technicraft Distribution Systems, Inc. (804) 346-1100	Business Management System	Modular	General ledger, accounts payable, accounts receivable, payroll, sales	Yes	Yes	Yes	128K	No		Contact vendor
Thoroughbred Software (division of Concept Omega Corp.) (800) 524-0430	Thoroughbred Accounting System	Modular	General ledger, accounts payable, accounts receivable, fixed assets, payroll, purchase orders, order processing (sales analysis, inventory control)	Yes	Yes	Yes	256K	Proprietary		$595-$795 (per module)
Tracs Software, Inc. (503) 626-6775	Medallion series	Modular	General ledger, accounts payable, accounts receivable, inventory and payroll	Yes	Yes	No	512K	Lotus 1-2-3, Ashton-Tate Dbase, any ASCII or SYLK file		From $425 (per module)
Trac Line Software, Inc. (800) TRACLIN	Integrated Accounting	Integrated	General ledger, accounts payable, accounts receivable, order entry, billing, purchasing, inventory control, sales analysis	Yes	Yes	No	512K	Lotus 1-2-3, any ASCII file		$1,995-$2,995 (total system cost)
	Financial Controller	Integrated	General ledger, accounts receivable, cash flow, sales analysis	No	Yes	Yes	256K	Lotus 1-2-3, any ASCII file		$895 (total system cost)
Vertical Business Software, Inc. (800)-632-8305 (914) 632-8305 (in N.Y.)	Complete Accounting series	Integrated	General ledger, accounts receivable, accounts payable	Yes	Yes	Yes	256K, 512K (Macintosh)	No		$750 (total system cost)
	Complete Accounting series with Inventory Control	Integrated	General ledger, accounts payable, accounts receivable, invoicing, purchase order, return, price quote	Yes	Yes	Yes	256K (Macintosh)	No		$900 (total system cost)
Wichita Software Corp. (316) 684-9684	Petroleum System	Modular	General ledger, accounts payable, accounts receivable, payroll, inventory, revenue distribution, processing, production verification, lease management	Yes	Yes	Yes	512K	Any ASCII, DIF or SYLK file		$990-$1,290 (per module)
Worldview Software, Inc. (416) 860-1616	The Dollar Manager	Integrated	General ledger, accounts payable, accounts receivable, payroll, inventory control, estimating and invoicing, banking, time billing	Yes	Yes	No	128K	Lotus 1-2-3, any ASCII file		$1,290 (total system cost)

Extra

REACH A BUILT-IN AUDIENCE OF DEC-INVOLVED PROFESSIONALS.

COMPUTERWORLD EXTRA GIVES THEM THE FULL STORY ON DEALING WITH DEC.

You can be part of a very special look at an important story for today's computer-involved professional: How to work and deal with DEC.

Computer-involved professionals will get that story on September 2. And you'll have a great opportunity to advertise your DEC-related product or service in a *Computerworld Extra* that examines the ins and outs of dealing with DEC. Topics planned for this *Computerworld Extra* include:

■ What it's like to work as a cooperative marketing partner with DEC.

■ Wrap-up and analysis of products DEC introduced to the market in the last 12 months.

■ Contrast of users who have jumped from IBM to DEC versus those who have jumped from DEC to IBM.

■ DEC's penetration of vertical markets-and subsequent status in those markets.

This *how to* on dealing with Digital Equipment Corporation has much to say to DEC customers. And since you do, too, you're in a perfect position to take advantage of a built-in audience of DEC-involved professionals.

And your reach will be increased by even more with bonus distribution at 1987 Fall tradeshows.

So if you market DEC or DEC-related products or services, here's an outstanding opportunity to reach more than 128,000 paid subscribers and thousands of passalong readers. Reserve your space by calling Ed Marecki, Vice President/Sales, *Computerworld* at (617) 879-0700. Or call your local *Computerworld* sales representative. This issue closes July 31, so hurry!

COMPUTERWORLD
Extra

With only one copy of Computerworld per department, security is extremely tight.

NEW PRODUCTS

Local-area network hardware

Lanex has unveiled its personal computer-to-broadband interface, the **Model PC588**.

The IBM Personal Computer-compatible device is an intelligent interface board is said to allow PCs to communicate via a broadband local-area network (LAN). The PC interface utilizes a 16-bit microprocessor and performs a variety of functions, ranging from terminal emulation to file transfers, as well as printer and disk sharing through an IBM Netbios interface. The LAN access protocols are consistent with IEEE 802.3.

The PC interface, Model PC588, costs $695.

Lanex, 10727 Tucker St., Beltsville, Md. 20705.

American Photonics, Inc. has introduced the **RL3000** Ethernet transceiver featuring diagnostic capabilities, activity indicators for network monitoring and a user-selectable heartbeat signal.

The RL3000 is said to provide access to Ethernet local-area networks for transmitting and receiving data packets in IEEE 802.3 and Ethernet Version 2.0 specifications for Carrier Sense Multiple Access/Collision Detect operation at 10M bit/sec. The RL3000 can integrate with either thick or thin Ethernet coaxial cable.

The RL3000 is priced at $250.

American Photonics, 71 Commerce Drive, Brookfield Center, Conn. 06805.

Links

An asynchronous remote bridge said to connect multiple remote Novell Netware local-area networks (LAN) to a local Network LAN over telephone lines has been introduced by **Novell, Inc.**

The **Netware Asynchronous Remote Bridge** also allows remote personal computers to access a local Network LAN. It uses asynchronous modems to support speeds to 19.2K bit/sec. Features include transparent operation and a traffic sensing mechanism that drops a line that has been open for a specified length of time.

The product is scheduled to be available in the third quarter

in both a single-line version that allows one connection and a multiline version that allows up to four concurrent connections.

The single-line bridge costs $385. The multiline bridge costs $995.

Novell, 122 E. 1700 South, Provo, Utah 84601.

CXI, Inc. has announced five local-area network (LAN) network-station macro-to-mainframe communications packages for IBM Personal Computers and Personal System/2s on LANs equipped with CXI's PCOX coaxial and remote gateways.

The packages support both IBM's Netbios and Novell, Inc.'s SPX LAN interfaces. Users can run IBM 3270-based applications, access mainframe files, save the contents of host screens and transfer files to and from the host.

PCOX/One provides both 3278 and 3279 terminal emulation with one host and one DOS session. It costs $150. **PCOX/Two** allows users to run a personal computer printer that emulates an IBM 3287 printer while working on a host session. It costs $200. **PCOX/Multi** provides concurrent access to five host sessions. It costs $275. **PCOX/One-APA** provides the features of an IBM 3179 G

graphics display terminal. It costs $295. **PCOX/Multi-APA** allows the user to run up to four display or printer sessions along with one APA graphics host session. It costs $385.

CXI, 1157 San Antonio Road, Mountain View, Calif. 94043.

Diagnostic equipment

A built-in RS-232 communications feature for its portable **DW300 Channel Monitor** has been announced by **Data/Ware Development, Inc.**

The RS-232 feature allows

DW300 *Channel Monitor*

the DW300 to be used by field service engineers to diagnose I/O channel faults detected between IBM or plug-compatible

mainframes and their peripheral controllers from a remote location. The user can view a complete replica of the DW300's front panel on a personal computer or terminal display screen. The keyboard allows the user complete remote control of the DW300 located at the mainframe site.

The basic DW300, including the built-in RS-232 communications feature, costs $11,995.

Data/Ware Development, 4204 Sorrento Valley Blvd., San Diego, Calif. 92121.

A **multi-LCN** emulation package used to test loading and throughput on CCITT X.25 communications links has been announced by **Digilog, Inc.** for use with its Digilog 800 Protocol/Performance Analyzer.

Features of the package include the ability to emulate up to 4,095 logical channels on any X.25 port; routines that check the loading or usage of all logical channels; and the ability to test X.25 links. Statistics provided include number of active channels, number of data packets sent or received and number of packets transmitted per second.

The software is available on diskette for $300.

Digilog, 1370 Welsh Road, Montgomery, Pa. 18936.

HARD TALK

James Connolly

Name of the game

There is a new game in town known as "The Early Shipment Game," and the winners, playing with a stacked deck, can only be computer vendors.

The game is simple. For example, in January or so a vendor introduces a product and says it will be available during the third quarter. Then, in May, a press release and a flood of sales representative calls to customers trumpet an announcement that the product will be shipped earlier than originally scheduled.

The spiel continues with the proclamation that development proceeded faster than expected and all of the vendor's loyal employees worked extra hard to get the system out the door months ahead of schedule.

With the advanced schedule, the system will ship in July rather than during the third quarter, the vendor boasts. One question should be raised, however: Since when is July not part of the third quarter or a Gregorian calendar?

One of the most notable players in this game during the

Continued on page 52

Aging PDP-11s get kickers

DEC says enhancements reaffirm commitment to 17-year-old line

MAYNARD, Mass. — Digital Equipment Corp. recently announced enhancements for several members of its PDP-11 series of minicomputers, including new packaging, memory and storage options.

DEC officials said the announcements represent a demonstration of the company's commitment to the 17-year-old product line.

The introductions include the PDP-11/84E series, which is based on the existing PDP-11/84 CPU and a nine-slot backplane. DEC said the PDP-11/84E is the first series of PDP-11/84s to support a 5¼-in. form factor. It is also available in a 10½-in., 27-slot box. DEC said the enhancements are intended to provide the basis for a building-block approach to systems configuration.

DEC also announced a 40% decrease in the basic monthly service charges on all PDP-11/84 systems.

PDP-11/84E prices start at $16,000 for the 5¼-in. box and $20,000 for the 10½-in. box. Prices for typical systems configured with multiple DEC RA series disks, DEC TU series tape drives and 32 to 48 terminal lines range from $55,000 to $75,000.

A-to-Z system premiers

DEC also announced the A-to-Z Business System, which is a packaged system that includes a PDP-11/23 processor and DEC's A-to-Z systems and applications software designed to run under DEC's VMS operating system.

Four configurations are available, each with a CPU in a desk-side enclosure, 2.5M bytes of memory, a diskette drive, a Winchester disk drive, an asynchronous lines and licenses for DEC's A-to-Z Base System, A-to-Z

Electronic Mail and A-to-Z Supercomm-twenty software. The configurations range in price from $14,788 to $19,765.

The company also introduced the MicroPDP-11/83 System, which features an additional 1M byte of memory over existing 500K-byte models. It is designed to improve performance by 25% for the same price as a similarly configured MicroPDP-11/53. Prices start at $14,500.

DEC also announced 5% to 15% price cuts on MicroPDP-11/83 systems. In addition to the hardware price cuts, DEC slashed the operating system price on a MicroPDP-11/83 by 57%. Entry-level prices for the MicroPDP-11/83 now start at about $25,000 with a CPU, a floating-point accelerator, a 159M-byte disk drive, a 71M-byte tape drive and eight asynchronous lines.

Intelogic discounts service

BY STANLEY GIBSON
CW STAFF

SAN ANTONIO — Moving from its base in personal computer maintenance to larger systems, Intelogic Trace, Inc. recently announced discounts of 40% below IBM list prices on maintenance of IBM's Systtem/34 and 50% discounts on IBM's System/36 maintenance prices.

The firm said the discounts are available in 28 major metropolitan areas. It also announced a similar price-support range of four hours for customers located within 25 miles of an Intelogic Trace service office in the same 28 major cities. Customers between 25 and 50 miles away can receive guaranteed response for the next half of the business day, Intelogic Trace said.

In 54 smaller cities, Intelogic Trace guaranteed service within a half business day and said it will offer 30% of regular IBM maintenance charges for System/34 and 20% off System/36 prices.

Continued on page 54

Data View

Internal throughput of IBM 4381
Rates compared with corresponding models of previous generation

Models						
11-R1	1.5	1.3	1.3	1.1	1.4	1.4
11-22	2.1	2.2	1.8	1.0	2.0	2.0
12-13	1.7	1.7	1.7	1.6	1.8	1.6
13-23	1.3	1.3	1.3	1.3	1.6	1.6
14-34	1.3	1.3	1.3	1.3	1.3	1.3

INFORMATION PROVIDED BY IBM

386 add-in targets VAX

BY DAVID BRIGHT
CW STAFF

GLENDALE, Calif. — The Intel Corp. 80386 microprocessor and Digital Equipment Corp.'s VAX family may seem like an unlikely combination, but Avalon Computer Systems has designed an 80386-based add-in board

Continued on page 54

Inside

■ Esprit ASCII terminal aimed at multiuser PC environments. Page 52.

■ Zetaco unfurls memory modules for DG processors. Page 56.

ASCII terminal targets multiuser PCs

BY ALAN ALPER
CW STAFF

MELVILLE, N.Y. — Esprit Systems, Inc. recently unveiled an ASCII terminal optimized for multiuser microcomputers running Microsoft Corp.'s MS-DOS and Xenix.

Called Opus PCT4, the terminal is said to allow users to access applications on IBM Personal Computers, PC XTs, ATs or compatibles as well as on all Intel Corp. 80386-based micros. In addition to MS-DOS and Xenix, the Opus PCT4 is compatible with a variety of operating systems, including Unix/DOS, Pick Systems' Pick, Novell, Inc.'s Advanced Netware/286 and The Software Link, Inc.'s PC MOS/386.

Like many ASCII terminals, the Opus PCT4 emulates a range of popular displays, including Wyse Technology, Inc.'s Wyse 50, Televideo Systems, Inc.'s Televideo 920/925 and Digital Equipment Corp.'s VT 52. In addition, the terminal's keyboard and display emulate the IBM PC user interface.

The Opus PCT4 offers dual ports, which enables concurrent connection through the same host running different sessions or separate hosts. It also enables users to hot-key between any two emulations or between PC terminal and standard ASCII display operations.

In its PC mode, the terminal is said to duplicate the complete IBM 256-character font set, keyboard layout and PC codes. It also uses the 25th line for display rather than status purposes.

Single-stroke storage

The terminal also features remote dial-in capability via Hayes Microcomputer Products, Inc. or compatible modems. Included in the terminal's pop-up window is a utility to store and dial computer numbers using a single keystroke. Esprit said it has made the pop-up window accessories standard on its most recently released terminals.

Priced at $649, the Opus PCT4 will begin shipping to Esprit's resellers at the end of the month, according to Sal Lanuto, director of marketing. The terminal is covered by the firm's 24-hour replacement service, he added.

The advent of true multiuser operating systems for microcomputers such as Digital Research, Inc.'s Concurrent DOS and Xenix has created a market niche for ASCII terminals makers to fill, Lanuto said. Esprit will compete with Kimtron Corp. and Wyse's Link, Inc. subsidiary in the marketplace, he added.

SCIENCE/SCOPE®

The HR-3000, a new generation version of the Hughes Air Defense Radar (HADR), can detect and precisely locate fighter-sized aircraft more than 470 kilometers away. The phased array radar is designed for air traffic control in peacetime and can automatically detect wartime threats that appear simultaneously from several directions, even in the presence of heavy environmental clutter and severe electronic interference. The HR-3000 system is in full production at Hughes Aircraft Company and will be used in Portugal and integrated with Hughes-built NATO Air Defense Ground Environment (NADGE) in Italy, Greece, and Turkey.

A two-way television system enables Minnesota students to be taught by teachers miles away. A consortium of seven school districts in east-central Minnesota operates this system in conjunction with local cable television operators as part of an elementary and high school program to promote telecommunications technology in education. It allows each district to produce and transmit live video and audio signals to other schools. Thus, specialized classes such as foreign languages and advanced mathematics and science are shared among the seven districts. The system also allows administrators to attend regional meetings without traveling. It consists of a microwave path from Cambridge to six outlying school districts 6 to 26 miles away. The microwave transmitters and receivers were manufactured and provided by Hughes.

U.S. Army's Fiber Optic Guided Missile (FOG-M) uses a new winding technology to deploy its plastic-coated glass fiber. This fiber permits a two-way jam-proof communication link for transmission of television-like pictures of enemy armor and helicopters to a gunner station located in a protected position. Using technologies learned from 20 years of producing Tube-launched, Optically tracked, Wire-guided (TOW) missiles, Hughes engineers developed a method of precisely winding optical strands so that they can be dispensed at missile velocities without interruption of the data transmission. Because the optical fibers are not much larger than the thickness of a strand of human hair and are elastic and pliable, Hughes invented a device which precisely measures the elasticity of each fiber thus allowing it to be spool-wound with precision. Another Hughes technological advancement is a diagnostic instrument that detects defects in the fiber.

Upgraded flight simulators will depict mission imagery realistically for U.S. Navy F/A-18 pilots. Hughes is modifying six Weapons Tactics Trainers (WTT) to present high-resolution, full-color, real-time simulated images of terrain features and man-made structures on 360-degree field-of-view dome screens that surround the trainer's cockpit. The out-the-window scenes will be produced by advanced computer imaging technology, using a digital database that represents 70,000 square miles of western Arizona and southern California terrain. The new simulated visual system will allow pilots to safely practice a host of complex combat scenarios without expending fuel or weapons.

Hughes' Santa Barbara Research Center has openings for qualified applicants experienced in engineering management or Space Flight Assembly organization. Your department will be responsible for assembly process development of high-quality space focal plane assemblies. If your career goals include manpower planning, resource allocation, and facilities and capital planning, contact the Santa Barbara Research Center, Professional Employment, Dept. S3, 75 Coromar Drive, Goleta, CA 93117. EOE. U.S. citizenship required for most positions.

For more information write to: P.O. Box 45068, Los Angeles, CA 90045-0068

HUGHES

Subsidiary of GM Hughes Electronics

© 1987 Hughes Aircraft Company

Stacking

past year or so has been IBM, although it has not been the only vendor using the strategy. IBM has played the game with its 9370 minicomputers.

The 9370s were introduced in October 1986, with deliveries scheduled for third-quarter 1987 for the 9373 Model 20 and 9375 Model 60 and fourth-quarter 1987 for the 9375 Model 40 and 9377 Model 90. In March, IBM advanced those dates by "up to two months earlier than previously planned." This brought delivery up to July and October, respectively — still the third and fourth quarter that were in the original announcement.

Of course, there is no bloodshed in the advanced delivery game; it isn't serious enough to knock someone out of business. Using terms such as "fourth quarter" gives vendors a three-month window to work within rather than the 30 days they would be boxed into if they named a month in the original announcement. However, the public's intelligence is insulted when vendors make it sound like they are doing customers a favor when they are really just living up to their promises. And there is no shame in doing that.

Connolly is a Computerworld's senior editor, systems & peripherals.

Intelogic

To be eligible, a company must be within a 50-mile radius of the cities specified in the plan.

In addition, if Intelogic Trace fails to respond within the specified time, maintenance for the equipment to be serviced will be provided free of charge to the customer for one month, the firm said.

Previous discounts had been 15% to 20% below regular IBM maintenance prices for System/34 and 36, said Roger Grant, vice-president of marketing and sales for Intelogic Trace.

In February, IBM slashed regular maintenance prices by 20% for System/34 and 36 and 12% for System/38. In the fall of 1986, IBM announced its Corporate Service Amendment (CSA), a discount program under which users can gain up to 33% savings by showing they normally handle some service problems themselves.

For the little guys

Grant claimed Intelogic Trace's discount program is aimed at both small and large users, but he said IBM's discount program is aimed solely at large customers.

Grant also pointed out that under the Intelogic Trace plan, no maintenance duties are being handed over to the customer, as they are under IBM's CSA. But Grant also said that customers with help desks and problem-resolution procedures in place can count on additional discounts of an unspecified amount.

Grant said the Intelogic Trace discounts signify a greater emphasis by the company on minicomputers and departmental systems.

Datapoint provider

The former maintenance wing of Datapoint Corp., Intelogic Trace is the major maintenance provider for Datapoint equipment.

The company has been servicing System/34 and 36 computers for about eight months, according to Grant.

Intelogic Trace also services the equipment of major local-area network vendors and maintains System/38 processors in some areas, Grant said.

Add-in

that it said triples the speed of DEC's Q-bus-based systems.

Intended primarily for value-added resellers of DEC's MicroVAX, the AP/20 Attached Processor increases a machine's performance by running compute-intensive programs offloaded from the DEC host.

"What we're doing is providing a way for Microvax users to build themselves a parallel computer," said marketing director Ross Harvey. He said programs that typically degrade system performance, such as large Fortran programs, computer-aided design and manufacturing, graphics and simulation software, will run much faster on the AP/20 by taking advantage of the 80386 chip's native 32-bit mode.

Harvey claimed the board provides better performance than the addition of a DEC floating-point option would. He said the board can run general-purpose programs, and performance can be further increased by adding several AP/20 boards.

According to Harvey, programs for the AP/20 are written and executed in the same manner as host VAX programs. To run on the AP/20, programs need only be recompiled with Avalon's C, Fortran or Pascal compilers, he said. The board's proprietary operating system runs the computational parts of a program while transferring I/O functions to the VAX, Harvey said. "The program still thinks it's running on the VAX even though it's not."

The board's software currently does not support Microsoft Corp.'s MS-DOS operating system.

The board's $10,000 price includes the operating system kernel and 4M bytes of random-access memory. An optional Weitek Corp. floating-point chip set is $1,900. Harvey said the board has a socket for Intel's 80387 math coprocessor, but that the Weitek chip set is faster.

NEW PRODUCTS

Processors

An industrial image processing subsystem designed for the VMEbus has been announced by Matrix Electronic Systems Ltd.

The MVP-VME provides such functions as real-time convolutions, morphological transforms, pattern matching and feature extraction.

The three-board set features 12-bit monochrome display, a memory-mapped frame buffer and monochrome graphics overlay.

The MVP-MVE is priced at $5,995.

Matrox, 1055 St. Regis Blvd., Dorval, Que., Canada H9P 2T4.

Data storage

A ½-in. magnetic tape coupler said to implement Digital Equipment Corp. TS11 and TSV05 emulations has been introduced by Distributed Logic Corp. for use with the DEC Microvax, MicroPDP-11 and LSI-11 computers.

The DQ152 tape coupler uses a very large-scale integration circuit that provides device-independent interface features for adding peripherals to Q-bus systems. The dual-height board operates transparently to the TS11 and TSV05 software driver contained in the operating systems.

The DQ152 contains a 64K-byte data buffer and features a drive transfer rate of 1.25M byte/sec.

The coupler costs $1,400.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Three add-on memory modules designed for Data General Corp.'s MV/4000, MV/10000 and S/280 processors have been introduced by Zetaco, a subsidiary of the Carlisle Corp.

The printed-circuit boards install in the DG computer chassis and are available in three capacities: Model MZ-412 adds 2M bytes of memory; Model MZ-414 adds 4M bytes; and Model MZ-418 adds 8M bytes.

The memory modules support 7-bit on-board error-correction code and use a 256K-byte, 150-nsec dynamic random-access memory.

The MZ-412 costs $3,395; the MZ-414 costs $7,495; and the MZ-418 costs $14,995.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

A multifunction controller designed to interface ½-in. optical disk drives to the ½-in. optical disk drive to be attached to any Microvax II running standard DEC VMS software.

The SMS 0109 controller is said to provide a small computer systems interface port that allows an optical disk drive to be attached to any Microvax II running standard DEC VMS software.

The controller also supports two fixed Winchester drives and two floppy drives, the company said.

The vendor has also introduced Optical System Software, a software utility and set of callable software routines that reportedly allow the VMS operating system to communicate with the write-once read-many disks.

The controller costs from $1,150.

The software costs $2,000.

Scientific Micro Systems, 339 Bernado Ave., Mountain View, Calif. 94043.

Printers/Plotters

A universal subsystem adapter for Data General Corp. systems, said to drive any Xerox Corp. centralized electronic-printer, high-speed Hewlett-Packard Co. printer or IBM 3800 series laser printer, has been introduced by Spur Products Corp.

The USA/Data General also drives the IBM 3211 high-speed impact printer and other laser printers that emulate the 3211, the vendor said.

The printers are said by Spur to offer operating features such as unlimited type fonts, type sizes ranging from four to 24 points, variable line and character spacing, variable page length and width and the ability to print on both sides of the paper.

The rack-mountable USA/Data General costs $9,000.

Spur Products, 13469 Beach Ave., Marina Del Rey, Calif. 90292.

NEC Information Systems, Inc. has introduced the LC-3000 series of laser printers.

The LC-3300 features 30 page/min output and 300 dot/in. resolution.

The LC-3400 offers 21 page/min output at 400 dot/in. resolution.

The printers, designed for multiuser environments, provide output on sheets up to 11- by 17-in. in size.

They feature a standard video interface, dual 250-sheet paper input cassettes, a 250-sheet output tray and a 20-sheet manual feed guide, according to the vendor.

NEC controllers are said to provide serial and parallel interfaces as well as page-description languages and support for Diablo Systems, Inc., Epson America, Inc., Hewlett-Packard Co. and Dataproducts Corp. command codes.

Prices start at $10,995.

NEC Information Systems, 1414 Massachusetts Ave., Boxboro, Mass. 01719.

IN DEPTH

Is the competition ahead? Then leapfrog them

The chief technology officer as innovator and integrator

BY DIMITRIS CHORAFAS

In the coming decade, the chief technology officer will play an important part in business, industry and finance. He will deal with the chaotic state of many computer and communications installations, healing the wounds that result from unplanned integration of incompatible systems, devices and services. Providing for efficient links is also an urgent task, one vital to the organization's survival; this, too, will fall into the chief technology officer's realm.

The less precise title of chief information officer generally indicates a high-level executive in a financial services or manufacturing organization responsible for integrating information and knowledge within the organization. This title, however, goes beyond the role of integrator; it includes duties expected in the realm of top management.

Until recently, more attention has been placed on the devices in use rather than on how technology could be used to better the organization. The results of this imbalance are obvious in the difficulties office automation created for many DP organizations as well as classical DP's inability to reap from what it had at its disposal.

While the effective implementation of new technologies requires a more conceptual than analytical mind, this does not ex-

KEVIN POPE

clude those with DP and MIS backgrounds from becoming chief technology officers, as in the cases of Carmine Vona at Bankers Trust Co. and George DiNardo at Mellon Bank NA. Nothing guarantees that good DP managers will reach the top, however, unless they continually train themselves in new technologies throughout their careers.

Success as a chief technology officer calls for a person with an open mind, a person of vision who can be satisfied with only the best. The person at this position must be ready to abandon old, trusted paths and take risks. Chief technology officers must be people of stature and recognized leaders in their fields. As

full-fledged members of top management, they should be able to explain to their colleagues the strategic directions of technology and to demonstrate how these strategies affect the company's business.

A chief technology officer should be a pacesetter, not a day-to-day operator. For example, the intervention of the chief technology officer at Sanyo Securities Co. in Tokyo was instrumental in the firm's use of computers and communications to reduce back-office support to fewer than one worker per securities sales representative. Other securities houses use an average of two people to support each sales representative. .

Sanyo Securities' chief technology officer has also been the impetus behind large-scale adoption of AI in dealer operations. Of the three-dozen banks and security houses I visited during 1986 in the U.S., Japan and Europe, Sanyo Securities is by far the most successful in implementing real-life AI, using AI to forecast market trends, projecting exchange-rate fluctuations and generating investment advice.

Innovator and consultant

Chief technology officers will be the innovators and technology consultants to top corporate managers in the following areas:

Engineering. In the case of banking or insurance, expertise

- **Divert resources from pseudo-problems**
- **Killer technologies on the scene**
- **Seeking a single AI-enriched solution**

Chorafas is a business consultant and author living in Saint Laurent D'Eze, France. His books include *Interactive Workstations*, *The Handbook of Data Communications* and *Computer Networks* and *The Software Handbook*.

HP Networking.
We connect offices,
cities or countries.

Like clockwork.

An integrated business system is only
as good as its connections. To other de-
partments or offices. Or branch offices.
Or even international offices.

At Hewlett-Packard, we've spent
ten years designing and supporting a
wide variety of local-area, wide-area
and office networking solutions. All con-
nectible to SNA-based systems. All
high-performance and cost-effective.
All based on OSI industry standards—
so they're all compatible with other
vendors. And they'll grow as you grow.

When you consider also that these
solutions come from the company that
never stops asking "What if...", you
may wish to make a connection with us.
At 1 800 367-4772, Dept. 282Z.

*we never
stop
asking* "What if..."

**HEWLETT
PACKARD**
Business Computing Systems

in high technology at the board director level — as well as an executive management — is still limited. Yet hardly a banking product is offered today that does not require a significantly high degree of automation. Technology plays an important role in banking. Although the modern bank has been said to be "information in motion," the motion is not achieved without technology.

Technology also gives rise to new banking products. At a banking symposium in Paris in June 1986, François Pasquier, general manager of Banque Internationale de Placements in Paris, said 35% of his bank's business results from products that did not exist 18 months earlier. It takes technology — not just information — to make a profit with new prod-

ucts. A chief technology officer needs the technical expertise to nurture these products and bring them into play.

Forecasting. In manufacturing, a tremendous amount of technology goes into new product development. Increasingly, the new product development effort and a company's information systems merge. Today, the microprocessor is an integral component of many man-made

---

IT TAKES technology — not just information — to make a profit with new products. A chief technology officer needs the technical expertise to nurture these products and bring them into play.

---

products. A chief technology officer needs the technical expertise to nurture these products and bring them into play.

Forecasting. In manufacturing, a tremendous amount of technology goes into new product development. Increasingly, the new product development effort and a company's information systems merge. Today, the microprocessor is an integral component of many man-made products. In a few years, products of distinction will not feature only microprocessors and memory but will also show their competitiveness through AI constructs.

Determining the upcoming generation of intelligent man-made products requires more than a polished information systems background. In the years to come, forecasting will be one of a chief technology officer's key responsibilities.

The executive's conceptual abilities will range from research and development to systems design and implementation.

Peer advising. The board of directors needs a colleague with whom to communicate on equal terms, and an internal management's executive committee. While specialists in their own fields, board members are not necessarily well-versed in high technology.

Currently, some leading-edge technologies — such as very large-scale integration and optical storage media — are capable of loosening a company's competitive grip if they are not incorporated into the organization. To face the challenge of these technologies and to capitalize on them — rather than expose the company's flanks — the board needs the advice and assistance of someone with perspective.

Enter the integrator

Along with the role of innovator and consultant, a chief technology officer must be an integrator.

Systems integration needs to be approached at the conceptual level. It does not occur simply by adding one, two or even a thousand interfaces. If MIS installs 65 incompatible physical networks, it will not be able to integrate them at the physical level through gateways or at the networking CCITT X.25 level.

As far as a chief technology officer is concerned, the critical problem is also grounded in the management of partially understood and poorly defined systems. Systems integration requires a valid concept, computer-aided design, a broad perspective in implementation and flexibility for renewal and expansion.

Integration solutions supported by computers and communications must be directed both into the firm and out toward its business environment. They should reach clients and suppliers and include sales, up to direct client dial-up, factories; and all facets that came into play at the corporate level. Electronics should replace paper, with employees working online through terminals, communications links and data bases.

Manufacturers Hanover Trust Co., like other organizations, has defined the integration role by instituting a new corporate division: Strategic Research and Technology. Established at the corporate level and directed by the company's board of management, this function underscores the role of high technology in launching new banking products and improving existing products to make them more competitive.

The division is split into the following four main functions, each allocated to a corresponding department:

Technical research. This includes AI, data base machines and the whole of pilot applications within one or more of the organization's five major operating divisions.

Systems architecture. This function's goal is to develop business plans for the implementation of computers and communications as well as to establish future directions in systems directions.

Data base architecture. This is primarily a planning function aimed at locating appropriate new tools and providing expert capabilities for data base management.

Policies and standards. This department affects all corporate-wide technological issues — both software and hardware — and assures homogeneity

throughout the different divisions.

A fifth department might also be included in this list.

Technology planning. Objectives here should range from following up on new tools (particularly programming tools and packages) to technology transfer. Also included is market evaluation: How far along is the competition in respect to our company?

Focus on strategy

A company's strategy is its master plan against an opponent. Other plans more specific in function and more detailed in nature are subordinate to it. Strategy is specific to the industry in which it is applied and to the company it concerns. Goals, resources, environment and organizational culture must be considered in shaping strategy.

Strategic planning must rest on three pillars: market perspective, human capital and modern equipment. Chief technology officers are not necessarily strategic planners, but they can contribute much to the strategic plan. They place information systems at the disposal of management to use as tools in planning.

Every organization needs to establish valid management approaches for addressing strategic and operational issues concerning computers and communications. One key question consists of confronting top management with, "What is our product line?"

The questions a chief technology officer can answer are, "What can technology do for our product line? Is our use of technology making our products more appealing? Sharply cutting our costs? Giving us a competitive edge in distribution? Increasing our products' reliability and availability?" For all these questions, the strategic aspects have to be answered first.

For example, one multinational bank takes the following approach in looking to technology to gain the upper hand against competition:

• The banking industry depends on computers and communications for the development, production and delivery of its products. Therefore, the technical solutions that are developed closely connect with the products and services that are offered. Just the same, the products and services depend on the technical solutions that are available — or can be made available.

• The change from a regulated to a nonregulated banking environment greatly affects competition. The strategic aspects have changed. The new opportunities for profit in banking services greatly affect the kinds of technology that can be used to give a bank competitive advantage. In addition, the technology to be adopted influences both the perspectives and the setting of the organizational framework.

With these two premises, the bank's top management analyzed the technological supports that characterized the last two generations of product strategy: the

second-generation product strategy — distributed data processing — of the early to mid-1970s and the third-generation product strategy — networking and distributed data bases — of the late 1970s to mid-1980s.

With this background, they took the forthcoming fourth-generation product strategy into consideration — a fully on-line system enriched with AI and other sophisticated features.

In a regulated banking environment, the now-obsolete second-generation banking products and associated technology might have been fine. But such a market does not exist. The market truly is dynamic and competitive. Because of its need to compete, this innovative, nonregulated environment demands high tech-

nology for survival. But it also requires getting the banking products to the marketplace faster.

According to the bank's analysis, if an organization is first in the market with a product and uses a fourth-generation product strategy, it can reap a good profit. It will make less with a third-generation product strategy. It will lose money with a second-generation strategy.

If, on the other hand, there are delays in bringing the product out and reaping its benefits, then the market will pass the organization by. Even a fourth-generation strategy will show losses — at least a few losses. Much more money will be lost with a third-generation strategy, and a second-generation strategy will amount to being bled dry.

This system solution exemplifies the implementation of corporate strategy. At the same time, the corporate strategy defines both the investment in and the nature of the system to be developed and implemented.

A chief technology officer is the innovator, the agent of change and the consultant of a chief executive officer.

Adapting to a new culture

At Nomura Securities Co. in Tokyo, the chief technical officer was instrumental in networking workstations throughout the organization. The goals of the new system design were to develop the best solution possible for account executives, managers and other professionals and to integrate all information sources into one

---

HAYES ANN
TECHNOLOGICAL
MODEMS THAT IM

Its long been thought that even the best of technology eventually becomes obsolete. A notion that we at Hayes could never really understand. And certainly never accept. So in defiance of it, we created the V-series Smartmodem 9600™ and V-series Smartmodem 2400.™ Modems that actually get better as they get older. Because they not only incorporate the most intelligent features found in modems today, they also possess the capability to provide a long-term growth path into the communications environments of tomorrow.

V-SERIES SMARTMODEM 9600

This is the fastest modem we've ever made. It can send and receive data at 9600 bps and with adaptive data compression achieve an effective throughput of up to 19,200 bps. Point-to-point error control, forward error correction and data flow control ensure that data gets there accurately.

The V-series Smartmodem 9600 also comes with automatic feature negotiation, a self-operating capability that analyzes all options for modem link and then selects the optimum feature set with any Hayes modem for the most efficient transmission at the highest shared speed.

Synchronous and asynchronous communications modes as well as simulated full-duplex employing advanced CCITT V.32 trellis code modulation and fast turnaround ping-pong technology are also part of the package. Plus you'll get the capability to link up with a range of networks, including SNA. And soon V-series technology will offer an X.25 PAD option to further accommodate network environments of today. And the future.

Ⓗ Hayes

intelligent terminal as well as to merge in-house information and outside financial information and market data into one logical structure. All account executives are connected to the Nomura Securities network. Each employee has a personal multifunctional workstation.

In network design, the goal is to achieve a single AI-enriched solution. Physical structures will

be integrated into it, but the top logical layer, currently under development, is universal. Decisions on the direction the implementation should take are necessary. In a banking environment, basic questions might include the following:

• Can we really afford to invest in a partial, near-sighted modification of a paper-based debit transfer system when the world

is moving swiftly toward satellite communications, interactive workstations and electronic mail?

• Can we afford to divert scarce resources for five to seven years to modify an already obsolete system when our competitors are learning to use electronics to deliver products on-line and increase customer service?

• Does it make sense to invest in

low-return changes and pass up high-return opportunities with new revenues such as expert systems?

Trying to increase paper-processing efficiency by solving problems-and proliferating specialized changes that hold little appeal in the marketplace does not make sense. This view consists of unrelated fragments that, in a few years, will leave a

bank wondering what happened to its market position, its clientele and its profits.

A new culture is needed — one based on high technology and the management of change. Chief technology officers should be an organization's change agents. To be such, they should be instrumental in convincing their peers at the top management level of the wisdom of organizationwide computer literacy.

Taking it from the top

Any successful computer literacy program starts at the top. The chairman, president and members of the board should be the first to embrace it. The board of directors must decide that the organization will use every opportunity to educate its people — from chairman to janitor — on technology. Harry Gray, former chairman of United Technologies Corp., demonstrated this point by being the first to take a computer literacy course in his organization; Mellon Bank Chairman and Chief Executive Officer J. David Barnes did the same.

To do this job ably, a chief technology officer must spend 100% of his time riding horses, not desks. To stay on top of technological advances and keep his personnel informed, his time should be spent as follows:

• Visiting the vendors of high-tech products, particularly computers and communications products.

• Meeting with top people of other organizations in the same or similar line of business.

• Talking to research personnel about future products.

• Attending seminars in order to learn from a lecturer who can offer perspective.

• Participating in conferences or symposia and being ready to exchange opinions.

Shared knowledge is the key to future growth. Free communication among technologists lubricates further progress. If communication is hindered, an organization's competitive edge will be dulled, and development will proceed much more slowly.

Logical resources are the foremost level of wealth at the end of this century. Logical resources differ from physical resources in one important way: The more we distribute them, the more we have.

For 15 years, I worked as a consultant to the chairman of a large financial and industrial group whose topmost priority was to focus on a given subject. He cared less about the decision than the process. He was convinced that not focusing on key subjects would eventually destroy the organization.

The role of a chief technology officer is now under scrutiny. How you implement it in your organization is your business. But the mission, I hope, is clear: •

MANAGEMENT

MIS's paper investments

The story I am about to share with you is true. The names have been omitted to protect the innocent, the guilty and the lazy. This story is about a project that was on the ropes, so to speak. But with a small investment in some very crude documentation, complaining users turned 180 degrees, becoming supportive, excited and willing to pay the bill.

First, let's put the subject of documentation in perspective. Do you consider documentation an expense or an investment? If it can make a difference in the success or failure of a development project, it certainly has potential value as an investment. If it speeds up the training of the personnel responsible for the operation of the system, doesn't that have a dollar value? Quicker recovery from system failures and outages certainly can be translated into dollars. If one of your key employees quits and no useful documentation is left behind, the time it takes you to diagnose a problem could be embarrassing and maintenance costs could be high.

Now for the story. For many years, the users had to work with some complex and unhandy batch programs to perform certain calculations. Then a quick-
Continued on page 68

Managers playing the numbers

To gauge performance, MIS leaders target customer satisfaction

BY DAVID A. LUDLUM
CW STAFF

Data processing managers plan to step up recently launched efforts to measure the quality and productivity of their systems, and they view customer satisfaction as the best gauge, according to a survey by the Quality Assurance Institute in Orlando, Fla.

The results of the survey, conducted for the first time, suggest that the use of quantitative measurements of DP quality and productivity is not widespread but is poised for growth.

The institute conducted the survey by polling 71 organizations that took part in its National Conference on Data Processing Quality and Productivity in Orlando last year.

The institute noted that this group is probably more advanced in the field of DP measurements than are typical organizations. "These are some of the largest corporations in the country, the Fortune 50-type companies," said William E. Perry, the institute's executive director. "It's not representative of the industry. They came to a conference on the subject."

Among the respondents, 55% said their organizations make quantitative measurements of DP quality or productivity through a formal program.

The organizations reported
Continued on page 67

Data View

Hiring trends

In a survey on hiring data processing, respondents from these industries said frequently reported plans to increase or reduce work forces in the second half of this year

Various components report plans for both increased and decreased hiring

INFORMATION PROVIDED BY THE COMPUTERWORLD DIVISION OF MANAGEMENT
RECRUITERS INTERNATIONAL, INC.
CW CHART/AMY J. SWANSON

State MIS eyes security

BY DAVID A. LUDLUM
CW STAFF

State government data processing managers face many of the same concerns as their private-sector counterparts, including lack of security and management support, according to an annual study.

A lack of physical and data security poses "frightening" prospects to state government information systems managers, just as it does in the corporate world, says Carl Vorlander, executive director of the National Association for State Information Systems, Inc. in Lexington, Ky., which recently released the results of its 1987 study of state government systems.

"One of the needs is a recog-
Continued on page 72

Tymnet unifies work force

BY JEFFREY BEELER
CW STAFF

SAN JOSE, Calif. — In a move aimed in part at improving interpersonal communications, the owner of the Tymnet public data communications service is embarking on a consolidation of its facilities in the San Francisco area.

The process is set to begin this week when Tymnet, McDonnell Douglas Network Systems Co., which owns Tymnet, moves some 250 software developers from their current workplace in nearby Cupertino, Calif., to a just-completed complex in this Silicon Valley city.

Slightly less than one month later, the consolidation should continue when the firm relocates its customer support and maintenance staff and its local network control center to the same site.
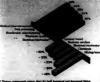
If all goes well, the process is expected to be completed by Sept. 15. By then, McDonnell Douglas will have moved roughly 1,100 employees and unified nine previously separate facilities stretching in a 40-mile arc from Cupertino to Fremont, Calif., according to project leader Phil Arroyo.

For Tymnet, the impending consolidation promises to improve the flow of internal information by removing barriers to
Continued on page 68

Playing numbers
CONTINUED FROM PAGE 65

they have been making the measurements for an average of 2.7 years, with 85% having started within the last three years.

The respondents suggested plans for significant increases in the use of the measurements, with 86% indicating they will use additional measurements in the next year. When asked to rate their direction during the next two years on a scale of one to five, with one representing an increase in use of measurements and five a decrease, the average response was 1.7.

Customer's always right

When asked to cite the most effective measures, respondents most frequently named customer satisfaction. This was followed by availability of applications to customers, adherence to budgets and keeping up with schedules.

When asked which activities they currently measure, however, respondents cited customer satisfaction fifth most often. It was preceded, in order, by project status, computer availability, computer operations and completion of system development documents.

More than one-third of the respondents — 38% — said they could not identify tangible benefits from the measurements, but most of those items are probably those with little or no experience with measurements, Perry said.

The payoff

Of the tangible benefits cited, the most frequently named were reduced maintenance, improved customer satisfaction, establishment of standards, fewer production errors and reruns and increased awareness of problems.

Most frequently cited as ineffective measures were adherence to project schedules, sticking to project budgets, employees' time reporting and the number of lines of code employees produce per day. "There's been an idea that the more lines per day, the more productive. The institute believes that's false. It's got nothing to do with how good the quality is," Perry said.

Adherence to budgets and schedules was reported as both effective and ineffective because "what some companies are doing well, other companies are doing very poorly," he said. "Some companies are just kind of picking numbers out of the air. That's my interpretation of why they're ineffective."

Respondents indicated that their best sources of data for developing measures are logs or other records from previously produced software, customers or end users, problem or incident reporting systems, accounting systems and quality control checklists.

More than two-thirds of the respondents — 70% — said they do not use software tools to collect quantitative information on data processing or to analyze it. No single tool was reported to be used by more than 17% of the group, the same percentage that indicated they use internally developed tools.

The obstacles to measurement programs most frequently cited were staff acceptance, lack of tools, getting started and reliability of data reported by staff members. Data that is reported by staff members can be unreliable on account of their lack of objectivity, ability or time, according to Perry.

Perry claimed the lack of quantitative measurement in data processing reflects a general lack of control. "Without some reliable numbers, DP management doesn't really know what they're doing," he said. "The tools of management are measurement and control. You can't control what you can't measure. If you don't measure DP, by definition it's out of control."

He said one participant in the conference cited the lack of measurement in speculation that senior managers rarely promote data processing managers to general management positions because "they're afraid they will run the company like DP — as an artistic endeavor without measures."

Investments

and-dirty process was initiated to develop a from-end program to present users with a menu of choices and then call in the selected program for execution.

Enter an outside vendor with an "easy-to-use" package of programs and clear instructions on how to use them. The users envisioned a short learning curve and increased productivity. What they didn't fully appreciate was the limited capability of the vendor's programs.

A decision was made to develop a simple tutorial that would provide an overview of the in-house system. The results were amazing. Users requested another tutorial on specific segments of the system. More tutorials were written. Consideration of the outside vendor's product was shelved. Relationships between MIS and user management improved.

There are a couple of factors that merit comment. One is the simplicity of the tutorials. The goal was to make them so simple that any member of the user organization, including the top manager, could sit down at a terminal and in just a few minutes successfully execute the system, albeit with simple examples.

The other factor concerns the cost appearance of the tutorials. They were drafted on a personal computer and printed on a dot matrix printer. Hard copies of display screens were reduced on a copy machine and pasted on the pages. Facilities were available to prepare very professional, high-quality publications, but the project manager wanted the tutorials to reflect a project that was still under development.

Write for hackers, lockers

There are some other factors MIS managers might consider in creating appropriate user documentation. The documentation must have a target audience. You may have to divide it into basic and advanced documentation. The basic documentation would be aimed at the novice and be used for training. The advanced documentation would be directed toward the experienced user and prepared for reference use.

Programmers in general have never been good at preparing documentation. One reason is that they know too much about the system. In preparing user documentation, you do not have to tell everything you know.

Try to target the basic documentation at learning or training. Then, target the advanced documentation at referencing a majority or high percentage of the situations that might arise. Next, let the help desk, backed up by the programming staff, serve as the resource for other rare or more complex questions.

If you do not have qualified staff with time to do the user documentation, there are alternatives. Perhaps the user could supply an individual to prepare the documentation. Or perhaps an investment in outside help would be wise in order to meet the schedule and satisfy the user.

Finally, remember that the documentation carries a very clear message. It reflects your concern for and interest in the users' needs. Preparing quality documentation suited to the purpose can pay great dividends, even to the point of being a key factor in your success.

Gillam is an independent computer and management consultant based in Ponca City, Okla.

Tymnet

interpersonal communication. "Because of the distances separating them, people in different sections that should have been communicating sometimes haven't done so," said Clint DeGabrielle, the network systems firm's vice-president of marketing and domestic field operations. "But once all of us are in a single location, employees who have never worked together before will finally be able to interface."

The imminent move is also expected to prove a boon to Tymnet's productivity by eliminating unnecessary travel between the firm's various local sites.

For Tymnet's users in the Fortune 500, the move is expected to improve response times to inquiries about the nature and scope of the network's services. With the new, consolidated complex, "Our entire Bay Area staff will be connected to the same general incoming phone number," DeGabrielle said.

For all its promised advantages, though, the proposed move is by no stretch of the imagination wholly without risk. "Our greatest fear," Arroyo said, "is that we'll shut down our phone and data communications systems on a Friday evening and won't be able to bring them up again in the new location by the following Monday morning."

To avoid such a calamity and ensure continuity of customer service, Arroyo said he will take some commonsense precautions. "We plan to have all the data lines and systems in our consolidated facility installed, checked and operational before we disconnect any equipment in the old site," he said.

As part of the upcoming move, Tymnet said it intends to replace its network control center's existing communications processors with some improved models, installing them before the move. The processors, manufactured by the McDonnell Douglas Computer Systems Division, will reportedly verify user passwords, collect customer accounting data, monitor data communications traffic and pinpoint network problems.

Recent PC
announcements
have left
Compaq
in an
enviable
position.

Compaq still

I n the midst of the clamor surrounding the new IBM® PS/2 series of personal computers, one thing is perfectly clear to people who really know PC's. COMPAQ® personal computers still work better. They're faster, more compatible, more expandable, and more flexible to accommodate the advancements so many users demand.

Consider flexibility. Compaq offers 5¼" diskette drives, and allows you to add 3½" drives if you want them. In fact, you can add up to four different storage devices on all COMPAQ desktop computers.

Demand for the 12-MHz COMPAQ DESKPRO 286 has nearly doubled since the PS/2 introduction.

The 12-MHz COMPAQ PORTABLE III is the smallest, most powerful full-function portable there is.

And what users demand are advancements that enhance their productivity *within* the industry standard.

Advancements that extract more performance from over 10,000 different business software programs—the largest library of productivity software in the world.

Still the performance leader

COMPAQ personal computers prove superior in overall performance.

Take speed. The COMPAQ DESKPRO 286® runs your software up to 20% faster than its PS/2™ counterpart. It also has high-performance fixed disk drives that are up to 2½ times faster than theirs, with access times averaging less than 30 milliseconds. What's more, the COMPAQ DESKPRO 386® sets all the records for speed in advanced-technology, industry-standard personal computers.

Examine compatibility. We let you use all the industry-standard software and expansion boards that you already own.

Look at expandability. Because our slots follow the industry standard, you have almost unlimited options to add the functions you need. Extra memory, networking, communications, and many others. So you can configure your system exactly the way you want it.

Finally, compare portability. You can't. The 12-MHz 80286-based COMPAQ PORTABLE III™ is the undisputed leader. It offers all the functions and performance you'd ex-

COMPAQ fixed-disk drives can access data up to 2½ times faster than PS/2 drives.

pect to find in the most advanced desktops. Without any of the compromises you'll find in other portables.

Enhancing not inhibiting

Each component in every computer we build is designed to be the best, both individually and as part of the overall system. This way enhancements work together to give you unparalleled performance. Faster RAM. Internal backup systems. Expanded memory and disk caching systems. Faster processors and coprocessors. Faster fixed disk

It **still** simply works better.

P.O. Box 2016, Manchester Center, Vt. 05255.

25th Annual Conference of the Urban and Regional Information Systems Association. Fort Lauderdale, Fla., Aug. 2-6 — Contact: URISA, 319 C St. S.E., Washington, D.C. 20003.

Resource Access Control Facility Users Conference. Anaheim, Calif., Aug. 3-7 — Contact: Ronn Bailey, Vanguard Integrity Professionals, Suite 109, 1720 E. Garry St., Santa Ana, Calif. 92705.

Symposium on the Simulation of Computer Networks. Colorado Springs, Colo., Aug. 4-7 — Contact: Charles Shub, Computer Science Department, University of Colorado, Colorado Springs, Colo. 80933.

Desktop Productivity Conference. Boston, Aug. 5-7 — Contact: Beth White, The Seybold Group, Inc., Suite 100, 100 Homeland Court, San Jose, Calif. 95112.

Extending the Human Mind: Computers in Education. Eugene, Ore., Aug. 6-9 — Contact: University of Oregon Continuation Center, 1553 Moss St., Eugene, Ore. 97403.

AUG. 9-15

Spocade III CAD/CAM Conference.

Coeur d'Alene, Idaho, Aug. 9-11 — Contact: Spocad, E. 502 Boone Ave., Spokane, Wash. 99258.

Very High Performance Engineering Workstations. Bedford, Mass., Aug. 9-11 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

International Computers in Engineering Conference and Exhibition. New York, Aug. 9-13 — Contact: Meetings Department, American Society of Mechanical Engineers, 345 E. 74th St., New York, N.Y. 10017.

2nd Annual Summer Camp for the Information Professional. Bedford,

N.H., Aug. 9-14 — Contact: Arnoulde & Ouellette Associates, Inc., #66, 40 S. River Road, Bedford, N.H. 03102.

Computer Art & Design Conference. Chicago, Aug. 10-14. Contact: National Computer Graphics Association, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

RDB Frontiers '87. Boston, Aug. 10-14 — Contact: The Relational Institute, Suite 106, 6489 Camden Ave., San Jose, Calif. 95120.

Macworld Expo/Boston. Boston, Aug. 11-13 — Contact: World Expositions, Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

Reach potential customers just as they're ready to buy.

In SPOTLIGHT, the buyer's guide to the computer world.

Inside *Computerworld* these days, you'll find SPOTLIGHT. Each one a special "buyer's guide" covering features, prices and specs for every major offering in a given product category.

For our readers, SPOTLIGHT provides a unique feature-by-feature tabulated product comparison in a handy pullout section. A section they'll save for quick reference when they're ready to buy. Plus editorial covering technology, user trends and brand category overviews.

For our advertisers, it provides an opportunity to strike while the iron is hot. And reinforce sales messages at precisely the right moment. Just as buying decisions are being made.

So reserve your space in SPOTLIGHT now. And get your message across when it will do the most good. When the buyers are buying.

For more information, contact Ed Marecki, Vice President/Sales at (617) 879-0700, or call your local *Computerworld* sales representative.

COMPUTERWORLD
An IDG Communications Publication

Sales Offices:
Boston: (617) 879-0700 New York: (201) 967-1350 Washington D.C.: (703) 280-3277 Atlanta: (404) 394-0758
Chicago: (312) 827-4433 Dallas: (214) 233-0882 Los Angeles: (714) 261-1230 San Francisco: (415) 421-7330

Upcoming SPOTLIGHT Issues

	Issue Date	Ad Closing Date
Aug. 10	DBMS for Large & Medium Scale Systems	July 24
Aug. 17	Field Service	July 31
Aug. 24	Education & Training	Aug. 7
Aug. 31	DBMS for Micros & Small Systems	Aug. 14
Sept. 14	Workstations	Aug. 28
Sept. 21	Large & Medium Scale Systems	Sept. 4
Sept. 28	Hardware Remarket	Sept. 11
Oct. 5	Small Scale Systems	
Oct. 12	Hardware Remarket	
	Leasing & Used Equipment	Oct. 2

nition on the part of the policymakers that [a lack of security] does exist. There's no sense of urgency. People say, 'You've never been hurt, so maybe we don't need to spend this kind of money,' " Vorlander said.

"Maybe that's our fault," he added. "Maybe we're not yelling loud enough, but we've certainly been yelling since we've been writing these reports."

State governments tend to run large, relatively sophisticated DP installations, Vorlander said. "You're talking about some pretty big files — three million automobiles or taxpayers." Like corporations, the states are rapidly installing IBM 3090-class mainframes and wide-area networks, he said.

The states' spending for software and communications grew 100% in 1986 from the previous year, with one reason being the greater availability of software applications, the study indicated. "A few years ago, all this was in-house. Now they're finding more and more off the shelf," Vorlander said. "Communications has just grown."

The study also points to a "dramatic" rise in the use of service contracts for designing systems and programming, perhaps in part because of a cautious economic outlook, Vorlander said. "Where it's a one-shot upgrade, we're not going out and hiring programming staff; we're not staffing up to the same degree," he said.

Some state budgets for computer training grew more than 50%, the study said. Some of the increase reflects an improved financial picture after severe budget constraints in the early 1980s, Vorlander said. "The emphasis has always been there; the cash may not have been."

State organizations also resemble the private sector in a shift in the role of information systems managers from control to coordination with the expansion of end-user computing, according to the study. This decentralization stresses the need for standards, integration, documentation, budget reviews and studies of cost-effectiveness, Vorlander said.

"There comes a time when this field has grown large enough that there's got to be a little decentralization to get the most effectiveness out of the current state of the art," he said. "I've always felt that state government pretty well reflects the corporate world. In some cases, they lead it. In some cases, they are behind."

COMPUTER INDUSTRY

Faster chip within sight

A few years ago, gallium arsenide semiconductors were touted as faster, cooler and more immune to electromagnetic radiation than conventional silicon chip technologies. Some market researchers predicted that these semiconductors would account for multibillion-dollar markets by the mid-1990s.

But reality has not borne out those lofty projections. The high cost of gallium arsenide microchips, advances in complementary metal oxide silicon technology and the semiconductor industry slump have combined to prevent the gallium arsenide markets from taking off as rapidly as was originally expected.

Many electronic systems designers have concluded that gallium arsenide will remain a niche market for specific uses in high-speed telecommunications, signal processing, military intelligence and some supercomputers.

Back in limelight

Now, new forces are at work again boosting gallium arsenide, and IBM is believed to have a large gallium arsenide research and development program. The inevitable drive for higher speeds in supercomputers is undoubtedly a major factor.

The latest R&D programs suggest it may be possible to increase by fivefold the currently known penetration velocity of electrons through gallium arsenide materials. Because gallium arsenide is five times faster than silicon on this score already, these microchips may be 25 times faster in the future.

If computing is following a trend toward optical technology because of the physical limitations of silicon technology at very high speeds, then gallium arsenide microchips, with their optic capabilities, appear even more attractive. Thus, even skeptical venture capitalists are again giving attention to gallium arsenide start-ups.

Kopin Corp. in Taunton, Mass., is one of the latest ventures involved in the development of thin films of crystalline material, which are expected to lead to larger and cheaper gallium arsenide microchips. *Continued on page 75*

Industry rebound continues
Apple, NCR exceed expectations; Oracle, DCA continue to thrive

BY ADAM STONE
CW STAFF

Led by NCR Corp., Apple Computer, Inc. and Tandem Computers, Inc., the computer industry last week reported generally strong second-quarter financial results that continued the upswing trend of the first quarter.

In addition, semiconductor industry showed strong recovery signs, with both Intel Corp. and Advanced Micro Devices, Inc. (AMD) reporting their strongest quarters in two years or more (see story page 74).

NCR exceeded its earnings expectations for the quarter and reported its seventh consecutive quarter of double-digit revenue increases.

NCR posted earnings of $98.6 million, an increase of 25% from the $78.9 million in earnings it reported in the like quarter a year ago. Sales grew to $1.35 billion, up 16% from last year's figures. Earnings per share were $1.05, up from 80 cents in the like quarter last year.

NCR's earnings came in above most industry expectations, primarily because of the firm's personal computer sales, according to Bob Grandhi, an analyst with Interstate Securities, Inc.

Increased sales of NCR's personal computer and Tower supercomputer lines, both introduced within the last five years, contributed heavily to the revenue increases, according to Jona-

1987 second-quarter earnings
The industry showed solid growth in many sectors, but IBM continues to lag

- Reported loss of $27.5 million in 1986
- Reported loss of $20.3 million in 1986
- Reported loss of $800,000 in 1986

CW CHART

than Fram of Bear, Stearns & Co. in New York. "I think the company made a good bet on new products a few years ago," Fram said.

The weakening of the dollar abroad also contributed to the company's revenue increases, analysts said. NCR's Pacific and European marketing groups led the overall revenue advances.

Apple. Analysts said Apple's third-quarter sales widely exceeded industry expectations. The company reported net income of $53.5 million, or 40 cents per share, an increase of

65% from the $32.3 million, or 25 cents per share, reported in the like quarter last year.

Revenue grew to $637.1 million, up 42% from the $448.3 million in sales it reported in the corresponding 1986 quarter.

Willard Brown of First Albany Companies, Inc. in Albany, N.Y., called the revenue increases "almost unbelievable."

Apple attributed half of its quarterly revenue to the high acceptance of the Macintosh products, especially the Macintosh SE and the Mac II, as well as *Continued on page 75*

Hogan chairman resigns

BY ALAN ALPER
CW STAFF

DALLAS — In a major shock at one of the software industry's hottest recovery companies, Hogan Systems, Inc. Chairman and Chief Executive Officer George L. "Larry" McTavish abruptly resigned last week over "philosophical differences" with the banking software company's board of directors.

McTavish, who last month was promoted from president to succeed Gregor Peterson [CW, June 15], could not be reached for comment. A company spokesman said McTavish and the board have agreed not to reveal the nature of their differences.

Gary Fiedler, a Hogan board member and chairman of First Interstate Bank of Nevada NA, was named to replace McTavish. Fiedler, who has held a number of positions within the banking *Continued on page 74*

Ask to swallow competitor NCA
Acquisition further firm's position in DEC manufacturing software

BY JAMES A. MARTIN
CW STAFF

LOS ALTOS, Calif. — Ask Computer Systems, Inc. said last week it plans to acquire NCA Corp., a competitor in the Digital Equipment Corp. manufacturing software market, for $43 million.

Under the agreement, Ask will make a tender offer to acquire NCA's outstanding common and convertible stock, and NCA will become a wholly owned subsidiary.

Ask developed and markets a manufacturing management information software system, called Manman, for use in DEC and Hewlett-Packard Co. HP

3000 minicomputers.

NCA currently offers a manufacturing resource planning system that integrates manufacturing, financial and sales and marketing information. The firm's software is DEC VAX compatible, and the company is a reseller of VAX systems and peripherals.

Strengthens presence

The acquisition should enable Ask to "get more products onto the factory floor," said John Girton, an analyst with Birr, Wilson Securities & Co. in San Francisco.

"This may be a way for Ask to take NCA's software, which helps companies manage inven-

tories, and integrate it onto the factory floor through computer-integrated manufacturing," Girton said. "So they'll be able to integrate the two packages, if that's what they intend to do."

However, NCA might prove to be "a drag on Ask's earnings" for a while, Girton said.

"NCA's debt level — about $10.7 million — is a little heavy, and the company has lost money for several years in a row," he added.

'Buying customers'

According to William Shattuck, a software analyst with Montgomery Securities in San Francisco, the merger will help Ask move further into the desirable DEC

manufacturing market. "On the surface, however, it looks like Ask is really just buying customers and market share rather than expanding into any new markets," Shattuck said.

Ask approached NCA for acquisition as a means of increasing its own market share, according to Ronald Braniff, chief executive officer of Ask. The combined companies are expected to have an installed base of about 2,000 systems, divided equally between HP and DEC environments.

Plans for integrating products and for staff changes have not been discussed yet, Braniff said. "There will be some degree of overlap in all areas of the company, but our goal is to bring into the company all the people we can," he said.

Officials at NCA were not available for comment.

Sprint replaces president

Former United Telecom exec to take charge of troubled firm

BY ELISABETH HORWITT
CW STAFF

KANSAS CITY, Mo. — After a year of aggressive expansion coupled with mounting operating losses under President Charles Skibo, U.S. Sprint Communications Co. has replaced Skibo with Robert Snedaker Jr., the company announced recently.

Snedaker is the former vice-chairman and chief operating officer of United Telecommunications, Inc. He may have been hired to introduce bottom-line consciousness to the troubled company, or to evaluate whether the Sprint past venture between GTE Corp. and United Telecom should be terminated, according to John Bain, a senior vice-president at Shearson Lehman Brothers, Inc.

"Snedaker has been put in there to fix things or else to write the venture off," Bain said.

GTE and United Telecom jointly announced that Sprint's financial results for the second quarter of 1987 will include a nonrecurring pretax charge of approximately $350 million. Of this charge, $76 million reflects a write-off of uncollectible accounts receivable from problems experienced during the start-up of the joint venture, rapid customer growth and the transition to consolidated billing system.

An additional $260 million stems from a write-down of analog microwave network assets, which are being made redundant as the company nears completion of its fiber-optic network. The network is scheduled to carry 90% of the interexchange carrier's traffic by year's end, the partners said.

On a losing streak

Inefficient bill collection has been just one of Sprint's woes under Skibo's year-long tenure, according to Bain. The analyst noted that the company's losses have grown larger each quarter, and predicted that the second quarter would show a $600 million to $650 million loss on $600 million to $700 million in revenue.

Bain estimated that uncollectibles constituted 19% of Sprint's first-quarter revenue, while leased facilities for WATS and other telecommunications accounted for 27%. The latter figures reflect Skibo's strategy of aggressive expansion and recruitment of new customers, Bain said.

"Last year, Sprint offered an additional 10% discount if customers signed up for a year. They got a tremendous response, and were forced to lease more facilities from MCI [Communications Corp.] and AT&T because they couldn't support the increased traffic on their existing facilities," Bain said. This may have completely erased Sprint's profits from those new customers, he added.

Chip industry on the mend

Intel, AMD report healthy revenue, income for quarter

BY JAMES A. MARTIN
CW STAFF

The U.S. semiconductor industry showed further signs of recovery last week, with two of Silicon Valley's leading chip makers, Intel Corp. and Advanced Micro Devices, Inc. (AMD), reporting strong revenue and income. AMD reported its first profitable quarter in two years.

Each company's revenue growth reflects a strong upturn in the chip industry as a result of sales of a variety of chip technologies, according to Thomas A. Thornhill, technology analyst for Shearson Lehman Brothers, Inc. in San Francisco.

"These companies have been through difficult period already, so they're fairly lean and more efficient, and they're getting good earnings increases as a result," Thornhill said. "But more importantly, their growth has been based on a broad range of products. The micro area has been important for sales, but so have discrete and standard logic products. That's the best indicator of a strong recovery."

Intel said its second-quarter sales were $439 million, compared with $305 million for the same period last year. Net income was $46 million, or 38 cents per share, compared with a net loss last year of $20 million, or 17 cents per share. Intel had not enjoyed a net income of that size since

third-quarter 1984's $70 million.

For the first six months of fiscal 1987, Intel's revenue was $833 million, up 42% from $585 million. Net income was $72 million, or 59 cents per share, compared with a loss of $43 million, or 36 cents per share.

Intel's actual income would have been higher without the $10 million spent to surprise its 18,000 employees with a bonus check equaling one week's pay. The company rewarded those employees on board since Dec. 31, 1986 for helping Intel through its slump.

AMD, Motorola show gains

Sunnyvale, Calif.-based AMD reported first-quarter sales of $192.4 million, compared with $154 million for the same quarter last year. Net income was $4.1 million, or 2 cents per share, compared with a net loss last year of $28 million, or 49 cents per share.

In another encouraging sign for the chip industry, Motorola, Inc. reported that sales of its semiconductor products increased 13% in the second quarter.

Motorola also said its semiconductor profits increased by an unspecified amount. New orders, led by demand from computer vendors, consumer electronics firms and semiconductor distributors, rose 19%.

Hogan

industry, has resigned his post at First Interstate to run Hogan on a full-time basis, the Hogan spokesman said.

Although Fiedler has not previously held a position within the software business, analysts said he has been around Hogan long enough to understand its products and position in the market.

"He's been more involved in Hogan than his position as a board member would connote," said Terrence Quinn, an analyst with E. F. Hutton & Co. "Hogan's board has been more actively involved in running the company than most boards are."

Analysts expressed surprise at the timing of McTavish's departure. "It's absolutely a surprise; it's something of a shocker," noted David Thomas of Hambrecht & Quist, Inc. "Apparently, the board suddenly lost confidence in him for some reason."

Mastermind profit strategy

Many industry observers have credited McTavish with masterminding the strategy that enabled the once-foundering company to regain profitability and credibility. Through the first nine months of fiscal 1987, Hogan's revenue was up 36% to $30.7 million, while operating profits reached $4.8 million, compared with a $4 million loss for the corresponding period last year.

Expense reduction and a strengthening of its international customer base have played a part in returning the company to profitability this year after two consecutive years of losses, analysts have said.

Analysts have also lauded McTavish's

recent acquisitions of Systems Four of Durango, Inc. and GDK Systems, Inc., which have enabled Hogan to flesh out its product line and are expected to provide incremental growth.

A key to the firm's strategy is the unprecedented relationship McTavish forged with IBM last year, when IBM became the exclusive marketer of Hogan's banking software in the U.S. and Canada in return for royalties. Analysts last week said IBM reportedly has recently reached contract agreements with a number of unidentified banks. "The IBM deal appears to now be taking off," Hambrecht & Quist's Thomas said.

Speculation about McTavish's unexpected exit centered around a variety of issues, including disagreements with certain board members on the future direction of the company and personality conflicts.

McTavish "may have planned several more acquisitions that, in terms of size, were bolder than what the company had done before," E. F. Hutton's Quinn noted. "Perhaps the board would not go along with him."

McTavish may have been pushing to broaden Hogan's relationship with IBM on either a product or geographical basis, Quinn suggested. McTavish is also believed to have been interested in getting Hogan into the professional services business, he added, a move the board may have contested.

One analyst, who requested anonymity, said McTavish's resignation may have resulted from a power struggle with former chairman Peterson, who remains on the board. "There may have been some professional jealousy between Peterson and McTavish, since McTavish is credited with turning around the company," the analyst noted.

Rebound

the Apple II GS.

"The most important thing is that they are making progress in the corporate accounts," Grandhi said. "They are opening doors in the Fortune 1,000. That's a very strategic thing for Apple. It seems that corporate America has decided to make new investments in the PC area."

Brown speculated that in 1983 and 1984, there was a mad corporate rush for PCs, and when massive productivity increases were not instantly forthcoming, the storm died down a little.

Apple spokeswoman Barbara Krause said she believes the Apple experience this quarter is indicative of a general upswing in the industry, brought on by the introduction of new products from Apple, IBM and other companies.

The September quarter should boost year-end revenue even higher, as personal computer sales to students and schools increase, according to William O'Connor Jr. of Fourteen Research Corp. in New York.

Tandem. Strong international business, accounting for 44% of fiscal third-quarter sales, propelled the Cupertino, Calif.-based fault-tolerant systems vendor to a 41% profit gain on a 31% rise in revenue. Tandem earned $25.6 million, or 26 cents per share, on revenue of $264 million.

Tandem reported major new contracts in its target markets during the quarter, including a pact with Morgan Guaranty Trust Co. of New York's Belgian operations center and deals with two of Japan's three leading retailers.

Honeywell, Inc. The only remaining wholly owned part of Honeywell's computer business, its Federal Systems unit, experienced a drop in profits compared with the like quarter in 1986. Most of Honeywell's noncomputer divisions had profit increases, contributing to an overall 24% rise in earnings from continuing operations to $54.3 million. Revenue increased 19% to $1.57 billion.

The company would not disclose the exact amount of the Federal Systems drop. However, the decline was sufficient to wipe out an otherwise increased profit in the company's aerospace and defense business.

When Honeywell Bull, Inc. was formed, Honeywell agreed to divide future Federal Systems profits with the spin-off company.

A Honeywell spokeswoman said that this profit splitting accounted, at least in part, for the reported drop in profits. The company would not disclose results from Honeywell Bull, which Honeywell jointly owns with Compagnie des Machines Bull and NEC Corp.

Honeywell Bull recently announced that Executive Vice-President Eugene Manno, a 26-year Honeywell veteran, had resigned to pursue other interests. Manno had headed Honeywell's Billerica, Mass.-based small systems division since 1982. Manno said his departure was not related to the formation of Honeywell Bull earlier this year. His responsibilities have been divided among several executives.

Oracle Corp. Oracle made a strong showing at its fourth quarter ended May 31, as it had throughout the fiscal year. Revenue increased 124% to $50.4 million, up from $20.8 million in the like period last year.

Net income increased 195% to $7.6 million, compared with $2.6 million in the corresponding quarter of 1986. Earnings per share increased from 8 cents in the like quarter last year to 24 cents.

Oracle, headquartered in Belmont, Calif., markets the Oracle relational data base management system. Its principal competitor in the field is Ingres, a product from Relational Technology, Inc.

"Oracle has jumped ahead of Ingres because of its focus on the IBM mainframe and IBM Personal Computer and on building a strong worldwide distribution network," said Scott Smith of Donaldson, Lufkin and Jenrette, Inc. in New York.

Fiscal 1987 revenue was up 137% to $131.3 million, from $55.4 million in the previous fiscal year. Net income was up 165% to $15.6 million, compared with $5.9 million last year. Earnings per share increased from 21 cents in 1986 to 50 cents.

Digital Communications Associates, Inc. (DCA). The Alpharetta, Ga.-based vendor of network communications systems reported that its net income for the year was up 91% from that of 1986.

Revenue for the fiscal year ended June 30 totaled $181.4 million, up 20% from fiscal 1986 figures.

Net income was $28.4 million, or $1.91 per share, compared with $1.10 per share a year earlier.

Net income for the fourth quarter was $6.9 million, an increase of 72% over the like period in 1986. Net income per share was 47 cents, up from 27 cents last year. Revenue for the quarter was $45.3 million, up 23% from last year but down 10% from the previous quarter.

Industry analysts said that the 10% quarter-to-quarter dip was caused by a decrease in sales of DCA's micro-to-mainframe communications product line, Irma.

According to Stephen Cotter at Montgomery Securities in San Francisco, the drop-off in sales was the result of a normal industry slowdown brought on by IBM's Personal System/2 announcement.

Now that companies have had a chance to evaluate the impact of the IBM announcement, Cotter said, DCA will be "on its way back to solid growth."

Seagate Technology. The Scotts Valley, Calif., manufacturer of rigid magnetic disk drives reported a strong quarter and year, with annual revenue more than doubling 1986 figures.

Revenue for the fourth quarter ended June 30 was $250 million, an increase of 77% from the $141.5 million reported in the fourth quarter of 1986. Net income for the quarter was $37.1 million, or 74 cents per share, up 126% from $16.4 million, or 34 cents per share, in last year's like quarter.

For the year, revenue was $860 million, up 108% from the 1986 total of $459.8 million. Year-end net income was $139.7 million, or $2.81 per share, up from $34.5 million, or 72 cents per share, reported last year.

IBM accounted for 17% and 24% of revenue for the quarter and the year, respectively. No other customer accounted for 10% or more of Seagate's revenue during either period.

Senior Editor Clinton Wilder contributed to this story.

Arete, Plexus scrap merger plans

SAN JOSE, Calif. — Unix-based systems makers Arete Systems Corp. and Plexus Computers, Inc. have canceled their previously announced intent to merge because of concern about integrating the two Unix-based product lines.

The decision to abort the merger was mutual, as each company's board arrived at it separately, according to both companies.

The combined company, which was to have retained the Plexus name, would have created a firm with about $65 million in annual revenue [CW. April 27].

The companies said they felt their multiuser system product lines, originally thought to be complementary, contained too much overlap for the merger to make sense.

Both firms said they expect no major changes because of the merger cancellation.

Arete sells primarily to OEMs, including Unisys Corp., while Plexus utilizes direct sales and value-added reseller channels.

Faster chip

um arsenide microchips. The 1984 start-up has received $25 million in two rounds of financing from leading venture capitalists, including the Charles River Partnership, Venrock Associates and a major unidentified industrial corporation.

Gigabit Logic, Inc. in Newbury Park, Calif., is the grandchild of gallium arsenide microchip ventures, with a total of $49 million in three rounds of financing

from a large syndicate of venture capital firms and major corporations, including Analog Devices, Inc., Crey Research, Inc. and Digital Equipment Corp.

With another two dozen or so major electronics manufacturers in the U.S., Japan and Europe positioning themselves to clean up on any gallium arsenide bonanza in the future, only the best financed ventures will have a chance of survival.

Smyrovics is president of 21st Century Research in North Bergen, N.J. and publisher of "Supergrowth Technology USA."

EMPLOYMENT TODAY

Getting paid what you're worth

Understand employer's salary range, approach negotiations cautiously

BY ROSE MULA
SPECIAL TO CW

Many MIS professionals approach salary discussions the same way they make new car purchases: They prepare to negotiate with a mixture of excitement and dread. Can they get the best deal, or will the slick interviewer talk them into accepting less than they deserve?

"I really hate job interviews," says one MIS applicant. "I don't mind talking about my qualifications, but I never know what to say when they ask about salary requirements. I want to make as much money as possible, naturally. On the other hand, I don't want to price myself out of the picture."

On the other side of the table, an employer depends on his workers to do their best possible jobs every day — unlike an automobile dealer, who is primarily concerned with short-term profits. The employer knows workers will not perform well if they feel cheated on salary.

"Salary negotiations are not adversarial situations," says Howard Specter, president of Gilbert Lane Personnel in Hartford, Conn. "Companies are looking for value, and they are prepared to pay for it. In fact, many employers often make unexpectedly generous offers."

Good impressions pay off

The best way for MIS professionals to make sure they experience such largess is to simply make a good impression on the employer throughout the interview process.

"Candidates should make the best possible impression on everyone from the receptionist to the employment manager to the potential boss," says Robert Hammond, president of R. F. Hammond & Associates in Lexington, Mass. "You should try to impress them all with your ability, energy and professional demeanor. Every position has a salary range. The more they want you, the more likely your offer will be at the high end of the range."

Despite the willingness of both the candidate and the interviewer to straightforwardly discuss salary, applicants should still be somewhat cautious about revealing their ideal salary, according to recruiters.

Moment of truth

Candidates should avoid specifying their salary expectations until they know that the company wants them and that they really want the job.

However, at some point during the interview process, candidates must answer the question: "What kind of a salary are you looking for?"

It's the moment of truth. The job is exactly what you want. Should you ask for less money than you expect because you don't know what the company will pay, so as not to risk losing the job? If you do present a low figure, you may regret it and find it awkward to retract.

Candidates who deal through an employment agency are sometimes in a better position to negotiate because agencies usually know the salary range for the job.

The want ads seldom hit salaries. But applicants can make an educated guess. "Check agency newspaper ads to determine salary levels for similar jobs," Hammond says. "However, keep in mind that some agencies follow the unfortunate practice of printing slightly inflated salaries in order to attract applicants. Use the figures shown only as a rough guide."

Hammond also suggests checking with friends who hold similar jobs. "You can't ask them what they are earning, of course, but you can say something like, 'How much do you think a good software engineer is worth?'"

In most cases, a candidate's salary requirements are closely tied to his current earnings. "A candidate can anticipate an average increase of 5% to 8% of current salary," Hammond says. "If

> ## SALARY negotiations are not adversarial situations. Companies are looking for value, and they are prepared to pay for it. In fact, many employers often make unexpectedly generous offers."
>
> HOWARD SPECTER
> GILBERT LANE PERSONNEL

you make an outstanding impression, a company might extend itself to 10%."

Hammond advises his clients to initially ask for a salary 10% higher than their current earnings. "If you feel you are in a strong position, you might even go as high as 12% to 15%, if such a figure is within the company's range for the job," he adds.

Howard Levin, director of

RSVP Services in Cherry Hill, N.J., concurs. "A 5% to 15% increase over current salary is a good rule of thumb," he says. "The higher end is justified if you possess critical skills that the company is having difficulty finding or if you've been working in a typically low-paying environment, such as a college."

Honesty's the best policy

Deborah Schrader, employment representative for Arkwright Mutual Insurance Co. in Waltham, Mass., suggests another approach. "It's very simple," she says. "To get the best offer, a candidate should simply tell the truth."

Often, people will lie about their current salaries, she observes, because they want a higher base from which to negotiate. "That is always a mistake," she says. "You eventually trip yourself up when you lie — you forget what you said to whom. It really isn't necessary, even if you are underpaid in your present job. Your current salary does not determine your worth. Your talents, skills and experience do. Our company often offers more than we know a candidate would accept because we want to be fair."

The bottom line is that most companies are just looking for bargain employees, Schrader adds. They want to hire good people who will stay with them at least three to five years.

Mula is a Waltham, Mass.-based free-lance writer.

Get a quick update on today's computer opportunities...FREE!

Our single largest listing of jobs; many available exclusively through Source

---

ADVERTISERS INDEX

This index is presented as an additional service. The publisher does not assume any liability for errors or omissions.

STOCK TRADING INDEX

Indexes	Last Week	This Week
Communications	103.4	103.6
Computer Systems	122.7	128.1
Software & DP Services	130.7	133.6
Semiconductors	111.2	118.9
Peripherals & Subsystems	115.6	117.9
Lessing Companies	120.4	119.7
Composite Index	103.1	103.6
S&P 500 Index	126.4	126.4

Communications

Computer Systems

Software and DP Services

Semiconductors

Peripherals and Subsystems

Lessing Companies

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 15, 1987

Communications and Network Services

Computer Systems

Software & DP Services

Semiconductors

Peripherals

Leasing Companies

EXCH = N = NEW YORK, A = AMERICAN, O = NATIONAL, O = OVER-THE-COUNTER, D = SPOT

D.T.C. PRICES ARE 1/8 AND PRICES ARE OF 3 P.M. OR LAST BID

[1] NO NEAREST DOLLAR

The grapevine

Rumors responsible for IBM ups and downs in volatile week

The stock market proved its volatility to rumors last week, and IBM was the yo-yo.

On Monday, a last-minute wave of expectations that IBM would report better-than-expected second-quarter results touched off a buying surge. IBM rose 2⅞ points to 169⅞, its high for the year.

The rumor, spurred by strong actual earnings reported by Apple Computer, Inc. and NCR Corp., lifted most major computer stocks. But on Tuesday, when IBM's actual results showed a 10% drop in earnings, a sell-off erased most of Monday's gain as the stock dropped 2⅛ points to 167⅜. Thursday, IBM closed at 168⅛, up 1¾ points for the week.

Apple maintained its momentum, gaining 6 points in four days to reach 64. AT&T, another firm with better-than-expected earnings, rose 2⅛ points to 31⅜. Digital Equipment Corp. edged closer to IBM price levels, moving up 6¾ points to 168½.

NCA Corp. in Santa Clara, Calif., surged 38%, up 2⅜ points to 8¼, after its announced acquisition by Ask Computer Systems, Inc. Ask gained 1⅛ points in four days to close at 13⅛ Thursday.

CLINTON WILDER

System/36, 38 hybrid held up

Hardware ready, but software isn't; System/36 upgrades due this year

BY STANLEY GIBSON
CW STAFF

DALLAS — IBM will not announce its much-anticipated processor to bridge the gap between the System/36 and 38 until 1988, the firm told a gathering of consultants here last week.

However, IBM said it will enhance the System/36 line later this year, probably by adding a new low-end machine and boosting processing speed and memory capacity.

In what attendees called a radical degree of candor, IBM gave some 30 industry observers details of its mid-range strategy and outlined plans to extend its version of the Unix operating system to a wider range of processors.

Some 20 IBM executives were in attendance, including Vice-Presidents Stephen Schwartz and George Kosrades.

"This was easily the most candid they have ever been," commented Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz.

The System/36-to-38 bridge — dubbed Silverlake — will be housed in an IBM 9370-type box and will use the same peripherals as the 9370, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

"The operating system is the key. But it is not there yet," Dzubeck said, claiming that IBM has the hardware of the new machine essentially complete.

The operating system will be designed to run existing System/36 and 38 programs. However, System/36 and 38 hardware will not be upgradable to the new processor, IBM told the gathering.

> **THIS** was easily the most candid they have ever been.
>
> MARTY GRUHN
> THE SIERRA GROUP

IBM said the new system will have ease-of-use features adapted from the System/36 combined with the integral data base of the System/38. IBM did not use the widely known code name Silverlake to describe the computer, but called the machine, "the follow-on 3X product," consultants said.

IBM also said it will offer electronic diagnostics and support for System/36 and 38 products, similar to what it offers for its 3090 mainframes, which have the ability to notify a remote site

of a malfunction.

Gruhn said the System/36 enhancements could be expected in the fourth quarter of this year and that a low-end System/36 is likely.

Craig Symons, vice-president of the Gartner Group, Inc. in Stamford, Conn., said the new machine could be based on IBM's Personal System/2, noting that the current low-end System/26 Personal Computer is based on IBM's PC AT.

Dzubeck said the System/36 enhancements could include an external disk-storage cabinet, which could include use of the 9335 disk drive that is used with 9370 and System/38 processors soon.

Much time at the conference was devoted to IBM's Systems Application Architecture (SAA), with company executives saying SAA applications cannot be expected until 1990.

However, consultants were told that communications protocols will be brought to AIX, IBM's version of AT&T's Unix, so that it can coexist in an SAA environment.

AIX will also be brought to more families of IBM processors, including the 370 line, several consultants said. AIX for the PS/2 will appear in the second quarter of 1988, IBM reportedly told one analyst.

According to Dzubeck, IBM also said both RPG-II, the language used to program the System/36, and RPG-III, used on the System/38, will be included under SAA. "This will make migration to the 370 world simpler," he said.

Consultants agreed that IBM called the meeting to reinforce the notion that its mid-range does indeed consist of two architectures, the System/36 and 38, which it calls one family, and the 9370.

Several attendees said they thought IBM was trying to change a prevailing negative opinion about its mid-range.

IBM said that it has sold 250,000 products in the System/34, 36 and 38 lines, and two-thirds of the total are installed outside the U.S. Consultants said IBM stressed that it would not abandon an installed base of this size.

Consultants were virtually unanimous in praise of the conference and in the opinion that IBM is closing the gap between itself and Digital Equipment Corp.

"IBM is doing more than [simply] posturing about it being the year of the customer. They are changing, fundamentally, their way of doing business," Gruhn said. She said IBM made a convincing case that it can offer better price/performance in the mid-range.

However, Gruhn added, IBM still has ground to make up in the areas of functionality and ease of use.

Court orders Samsung to halt PC sales

SANTA CLARA, Calif. — Delta Computer Corp. was granted a temporary restraining order last week barring Samsung Semiconductor, Inc. from selling products similar to Delta's IBM-compatible personal computers.

The Superior Court of California here ordered a restraining order effective immediately and lasting until a scheduled court hearing July 31.

Mansfield, Mass.-based Delta filed a $60 million lawsuit against Samsung, its supplier, for allegedly marketing Samsung PCs to dealers directly against the same products bearing the Delta label.

Delta claims Samsung signed an agreement in March for Delta to be the exclusive U.S. supplier of specific Samsung PCs.

Delta terminated the agreement last month and then filed suit.

"Before we even had our product out, they were advertising theirs," said Jim Patterson, Delta's vice-president of marketing and sales. "It was very unprofessional."

Patterson said Delta alleges that Samsung sales representatives from the Korean firm's Santa Clara subsidiary have been calling on Delta's authorized retail dealers.

IBM 9370

ed the same story but said he cannot use the processor that soon.

IBM spokesman last week confirmed that deliveries have been rescheduled as much as six months earlier on account of im-
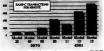
proved manufacturing capacity.

Forrester's McCarthy said he was also told that general availability of shipments of the 9370 Models 60 and 90 will begin in late October, which is consistent with IBM's previously an-

nounced timetable.

At last week's analyst briefing, IBM also outlined a number of plans for 9370 enhancements. The firm said it will offer MVS/XA on the 9370 Model 90, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. Bob Tasker, an analyst with The Yankee Group in Boston,

said the 9370 will offer CICS under VM later this year.

In addition, consultants were told that the 9370 will grow in power to further overlap the company's 4381 family. Although the 4381 may gain more

power, smaller processors will be added to the 3090 line. The result will be greater overlap among the 9370, 4381 and 3090 product groups.

'Architecture of future'

The Yankee Group's Tasker said IBM referred to the 9370 as "the architecture of the future." Bob Randolph of Framingham, Mass.-based International Data Corp.'s Digital Equipment Corp. advisory service, said the implication was that the 9370 would grow both upward and downward, like DEC's VAX, eventually obscuring the 4381 line.

IBM has been testing the 9370 processor at its Dallas facility, and, in a departure from past practice, the company made the testing information available to consultants at last week's meeting, promising more complete information as it becomes available.

The charts released by IBM detail the performance of 9370 and System/36 and 38 processors in comparison with DEC VAXs and processors from Hewlett-Packard Co. and other vendors.

Several graphs show the relative merits of IBM's proprietary Ramp-C commercial interactive benchmark, in which the 9370

stacks up as a solid competitor to the VAX and other processors, sometimes coming out ahead and at other times trailing other machines.

'Slinging mud'

Forrester's McCarthy said the new emphasis by IBM on mid-range benchmarks shows the firm has "jumped into the ring and are slinging mud, just like other vendors."

But McCarthy criticized the testing environment because it does not include real terminals and printers but just a connection to a 4381 that simulates the presence of terminals.

In what IBM claimed to be greater openness concerning benchmarks, the company announced that this fall it will make public the characteristics and features of its Ramp-C standard, according to Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz. However, IBM will not publish the code for the test, she added.

"For the last two years, IBM has been muddling along," Randolph said. "Then along came DEC and pointed the direction. IBM watched their success and then said, 'Aha! That's the way to go. Now, how fast can we get there?' "

Transaction points
IBM laboratory measurements distributed by IBM compare commercial interactive performance of 9370 and 4381 processors

RAMP-C TRANSACTIONS PER MINUTE

CW CHART

Ratings game
Argonne National Laboratory results distributed by IBM rate compute-intensive performance of 9370 and 4381 models

LINPACK MFLOPS
(FULL PRECISION)

Million floating-point operations per second

CW CHART

Computer bill clears legal hurdle

BY JEFFRY BEELER
CW STAFF

SACRAMENTO, Calif. — A bill aimed at strengthening the state's computer crime law now seems virtually assured of enactment after clearing last week what its proponents regarded as its most serious obstacle.

With last-minute amendments added by the California Assembly's Public Safety Committee last week, the bill would spare from prosecution any workers who use employers' systems for personal reasons as long as their misdeeds result in no data destruction or alteration.

In the bill's original form, employees who misused their companies' processors could be charged with a felony, even if their actions left the employer's data and programs intact. The rationale behind Senate bill 255's (S. 255) provision was that even the most innocent electronic security breach can force organizations to spend great sums

to recertify their systems' integrity.

The exclusion was grudgingly added in response to claims that S. 255's original language would make a serious crime of even minor infractions, such as the use of corporate systems for drafting resumes.

First raised by the Teamsters union during testimony before the Public Safety Committee on June 29, the objection drew a swift reply from the bill's backers, who denied any intent to outlaw benign systems access by employees. "Our purpose in drafting the legislation was to address full-blown computer crimes, not the unauthorized typing of personal letters," said Charles Fennessey, legislative consultant to state Sen. Ed Davis, S. 255's author.

In another rebuttal to the teamsters' stated fears, proponents also dismissed as highly improbable the suggestion that law enforcement officials would take the trouble to prosecute in-

siders for the nonmalicious misuse of corporate CPUs.

Reaction to the changes in S. 255's language ranged from gentle to disappointment.

Some displeased

"I'm not very happy with the amendments," said Los Angeles City Attorney Alice Hand. "But right now, I'm not sure whether the proposal to exclude investigative expenses from the bill's provisions is a major drawback."

But Organization Management, Inc. President Don Burns, one of S. 255's staunchest defenders, viewed last week's legislative developments somewhat differently. "I'm very pleased with what has happened to the legislation thus far," Burns said. "The amendments were added to the bill with the full understanding that they would be reviewed very carefully and might be altered at some future date."

If enacted, S. 255 would repeal California's existing computer crime law.

Firms lobby

FROM PAGE 1

cense to ship U.S.-made products out of the U.S.

Toshiba Machine Co.'s sale of submarine propeller technology to the Soviet Union was "outrageous," testified Joseph Tasker Jr., a Washington-based attorney who is representing the two trade associations. But, he said, there is a "risk that imposition of sanctions in the form of an import ban can cause serious economic harm to the American information technology industry."

Toshiba's subsidiaries make semiconductors, microcomputers, computer printers and disk drives, private branch exchanges, telephone equipment and consumer electronics products.

Other compensation

Tasker said that before imposing sanctions, the U.S. should use the Toshiba incident as leverage to press for stronger enforcement of export controls among

U.S. allies and to press for financial compensation for the damage to national security.

If sanctions must be imposed, the import ban should be limited to the offending subsidiary, Toshiba Machine, and not imposed on all units of the Toshiba parent, Tasker said. In any case, he added, an import ban should have a broad exemption for imported components used in U.S.-made products, similar to the exemption in the Senate bill.

Tasker said it would set a bad precedent for the U.S. to unilaterally impose sanctions against foreign firms for export control violations, because it could invite foreign countries to do the same against U.S. corporations, perhaps with less justification.

Positive punishment

James A. H. Johnson, director of government affairs for Apple, said Toshiba has made custom components for Apple's microcomputers since 1981. He praised the high quality of the Toshiba components and noted that it would take at least two

years to switch to another supplier.

"Instead of trying to bankrupt Toshiba and all of its subsidiaries around the world, let's make them pay for the costs of new research and development necessary to regain America's lead in military technology over the Soviets," Johnson suggested.

Tokyo Electric Power Co., a Toshiba subsidiary, makes Apple's low-end Imagewriter printer, an Apple spokeswoman confirmed.

Several members of the House Ways and Means Committee said they would try to draft sanctions that balance the need to penalize Toshiba with the need to protect U.S. manufacturers and distributors from economic harm.

However, Rep. Duncan Hunter (R-Calif.), supporter of a harsher penalty than on Toshiba imports, said Congress should put the interests of U.S. military security and personnel above the "convenience" of U.S. businesses and consumers.

PSsst — keep it quiet. Drumbeating over the next series of PS/2 announcements from IBM filled the air last week. According to one source, Big Blue will announce several systems, including the Intel 80386-based Model 70, the week of Aug. 10. They're all the obvious systems people have been talking about, the source said. The Model 70 has been described by some as a desktop 80386-based system that will compete directly against Compaq's increasingly popular Deskpro 386 system. Other much-expected systems are the Model 30, also known as the PC ET, for the education market and the Model 40, a less expensive version of the Model 50.

The sun also rises. Developers and users last week said Compaq plans to release a 20-MHz 386-based system in early September. One or two users said they believe the company will position the system as a graphics workstation with Microsoft's 386-Windows and Autocad's Autodesk bundled in. One user thinks this would be a smart move by Compaq. "People are skeptical about buying 386s because there is no OS or applications. But if you come in with one that has a purpose, like a graphics workstation, and give them some stuff to run on it, it's a good way to position it," he said.

Could it finally happen? Compaq is also debating whether to announce a Toshiba-like laptop, according to one user, but still can't decide if there is enough of a market for it. "The reception within Compaq is lukewarm, but I told them with the possibility of Toshiba being banned or hit hard with [congressional sanctions], there is a good opportunity there," he said.

Catcall of the week. One of AT&T's salesmen recently contended that reports that the Big Bell's computer division is up for sale are absolutely not true. "Everyone is too busy putting their resumes together to do any selling," he explained.

Rather switch than fight. Tandem announced last week that it has purchased a minority interest in third-party IBM Systems Network Architecture (SNA) networking vendor Netlink, Inc. The two companies will be working on products to expand Tandem's already impressive array of SNA connectivity products. Netlink now markets a network concentrator that allows different types of terminals to switch back and forth between IBM and non-IBM hosts.

Remote commission. The American National Standards Institute has commissioned a work item that might become the first part of a standard for distributed data base management systems. The X3H2 Committee has been asked to evaluate a suggested remote data base access protocol. The International Standards Organization is reviewing a protocol suggested by Britton A. P. G. Brown, and X3H2 Chairman Don Deutsch said he is resisting its report. The proposal uses SQL but incorporates other language forms as well, Deutsch said.

Do not pass Go. In nothing sacred? Even Parker Brothers, maker of the Monopoly board game, is waving its software copyright infringement saber. Beverly, Mass.-based Parker Brothers issued a press release warning "a number of individual programmers and software companies" against selling unauthorized software versions of Monopoly. Parker Brothers says it has officially licensed Monopoly to only two game software developers — Sega Master Systems and Virgin Games.

Network listings. The "then-current NCP" noted in royalty letters accompanying IBM's June 16 announcements heralds a new Network Control Program, according to industry sources. One source claims that IBM was all set to announce the new NCP on June 16, except that the program was designed to run with another long-awaited IBM introduction: the beefed up, dual-processor 3725. The source claims IBM insiders said there were unexpected last-minute glitches in the 3725, which delayed its unveiling, thus stalling the date when the "new" NCP will become current as well.